Design and Development Division – Transmission

Supply to Abitibi-Price Inc.
(Iroquois Falls)

Environmental Assessment

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1.0 SUMMARY

This document describes the cost, technical and environmental studies carried out by Ontario Hydro to establish an acceptable route for a 230,000 volt (230 kV) transmission line required to supply the Abitibi-Price Inc. plant expansion in Iroquois Falls.

A study was carried out from September, 1985 to April, 1986 to identify alternatives and recommend a route for the required transmission line. The public was involved in the study process through information centres and mailed information. This Environmental Assessment (EA) documents: the need for the additional power supply, the system alternatives that were evaluated, the alternative routes identified and evaluated, and following consideration of potential environmental effects and possible mitigative measures, the selection of a recommended route.

Based on this, Ontario Hydro is requesting approval under The Environmental Assessment Act, 1975, for the construction, operation and maintenance of a single circuit 230 kV transmission line. The proposed route is shown on Figure 1.1.

The proposed facilities are required to maintain a reliable electrical supply to the Abitibi-Price Inc. plant in Iroquois Falls. The peak load at the plant is expected to exceed the existing system capability during the winter of 1989-90. It is proposed to build the line from a junction in the 230 kV supply line to the Kidd Creek Met Site to Iroquois Falls, and placed in service as soon as possible, or during the winter of 1989/90.

The route recommended for approval is approximately 49.9 kilometres (km) long. Subsequent to approval of the undertaking, Ontario Hydro proposes, subject to any conditions of approval, and in consultation with potentially affected publics and municipal/provincial governments, to carry out more detailed studies to determine structure locations, property rights required, and specific natural environment and social effects. This process of right-of-way finalization will result in the identification of a right-of-way normally 40 meters (m) wide.

Following right-of-way finalization, Ontario Hydro proposes to carry out survey, detailed engineering, property rights acquisition, construction, operation and maintenance activities for the transmission line. Figure 1.2 outlines the steps in the study process.

2.0 INTRODUCTION

During the late 1970's Ontario Hydro identified a need to provide additional electrical supply to the Kirkland Lake area. The preferred method of supply was identified to be a new 230 kV transmission line from Porcupine TS, near Timmins to Kirkland Lake. In response to this need an environmental study was started in 1980 to select a preferred route for

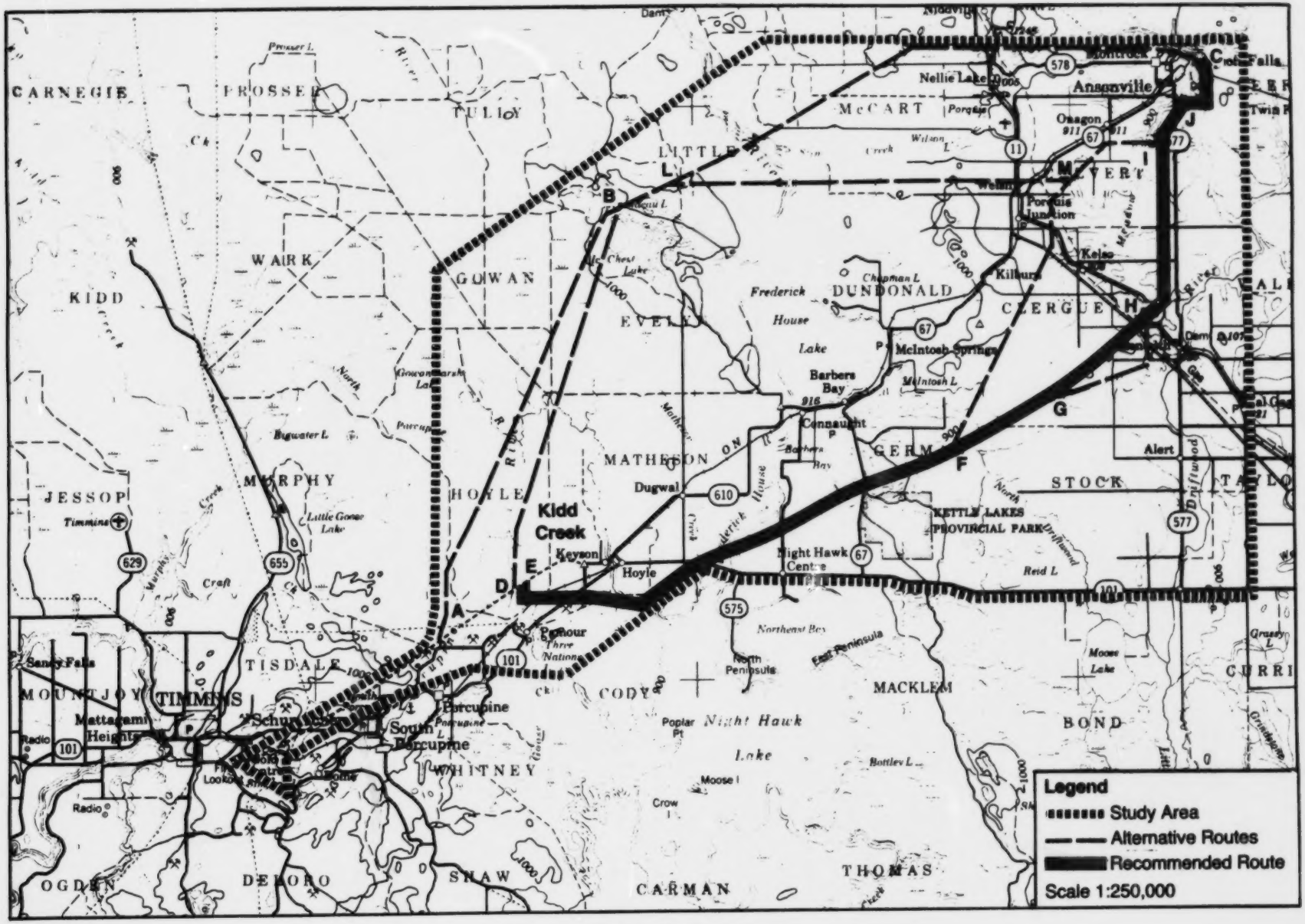


Figure 1.1
Recommended Route

RS-263-LUEP-RA6-0005

FIGURE 1.2

Study Process

Receive Customer request for additional supply	July 1985
* Carry Out Route Selection Process (Refer to Fig. 7.1)	Sept 1985 - April 1986
Prepare Environmental Assessment Document	Feb - May 1986
Submit Document to MOE	May 1986
* Government Review Process	May - Dec 1986
Obtain Government Approvals	Dec 1986 - May 1987
* Finalize Right-of-Way	June - July 1987
Acquire Property Rights	Sept 1987 - March 1989
Design and Construct Facilities	Sept 1987 - Feb 1990
Operation and Maintenance	After Feb 1990

* opportunity for public involvement

such a transmission line. The study progressed through data collection, alternative route identification and preferred route selection steps before it was cancelled in response to reduced growth.

The study area identified for this study, Supply to Abitibi-Price Inc., is a reduction of the original Supply to Kirkland Lake study area. The land use and environmental data previously collected was applied to this study with minor updates and re-organization.

The public involvement program for the Supply to Kirkland Lake study included the participation of citizens' committees which assisted Ontario Hydro in identifying and expressing the relative importance of the local environmental resources through a ranking process. The ranking of resources provided by the committees was used to rank the updated environmental resource data applied in this study.

3.0 THE UNDERTAKING

The undertaking for which approval is being requested is the acquisition of property rights for, and the construction, operation, and maintenance of a 230 kV single-circuit overhead transmission line from Timmins to Iroquois Falls. The undertaking includes the acquisition of a right-of-way between a point on the existing 230 kV single-circuit line near the Kidd Creek Met Site and the Abitibi-Price Inc. transformer station in Iroquois Falls following the recommended route, shown in Figure 1.1. The recommended route is approximately 49.9 km long and the right-of-way will be approximately 30 m wide beside an existing transmission line and 40 m wide in areas where the proposed transmission line will be on a new right-of-way.

4.0 PURPOSE OF THE UNDERTAKING

The general purpose of the undertaking is to meet the requirements of the Ontario community for electric service, to result in the greatest overall benefit to that community and to provide the lowest cost service to the customer over the long term.

Specifically, the purpose of this undertaking is to meet the forecast electric power and energy demand of Abitibi-Price Inc. in Iroquois Falls.

5.0 THE EXISTING SYSTEM AND SYSTEM OPTIONS

5.1 Existing Generation and Transmission Facilities

The Northeastern Region of Ontario Hydro presently supplies about 15 percent of the total Ontario Hydro hydraulic generation production from the Abitibi, Mattagami and Montreal Rivers. As shown on Table 5.1, Northeastern Region switched from export to import of electricity as loads have grown in the area. For the years (1980, 1981 and 1982), an average of 25 percent of Northeastern Region's consumption has been imported from other parts of the Ontario Hydro electrical system. The

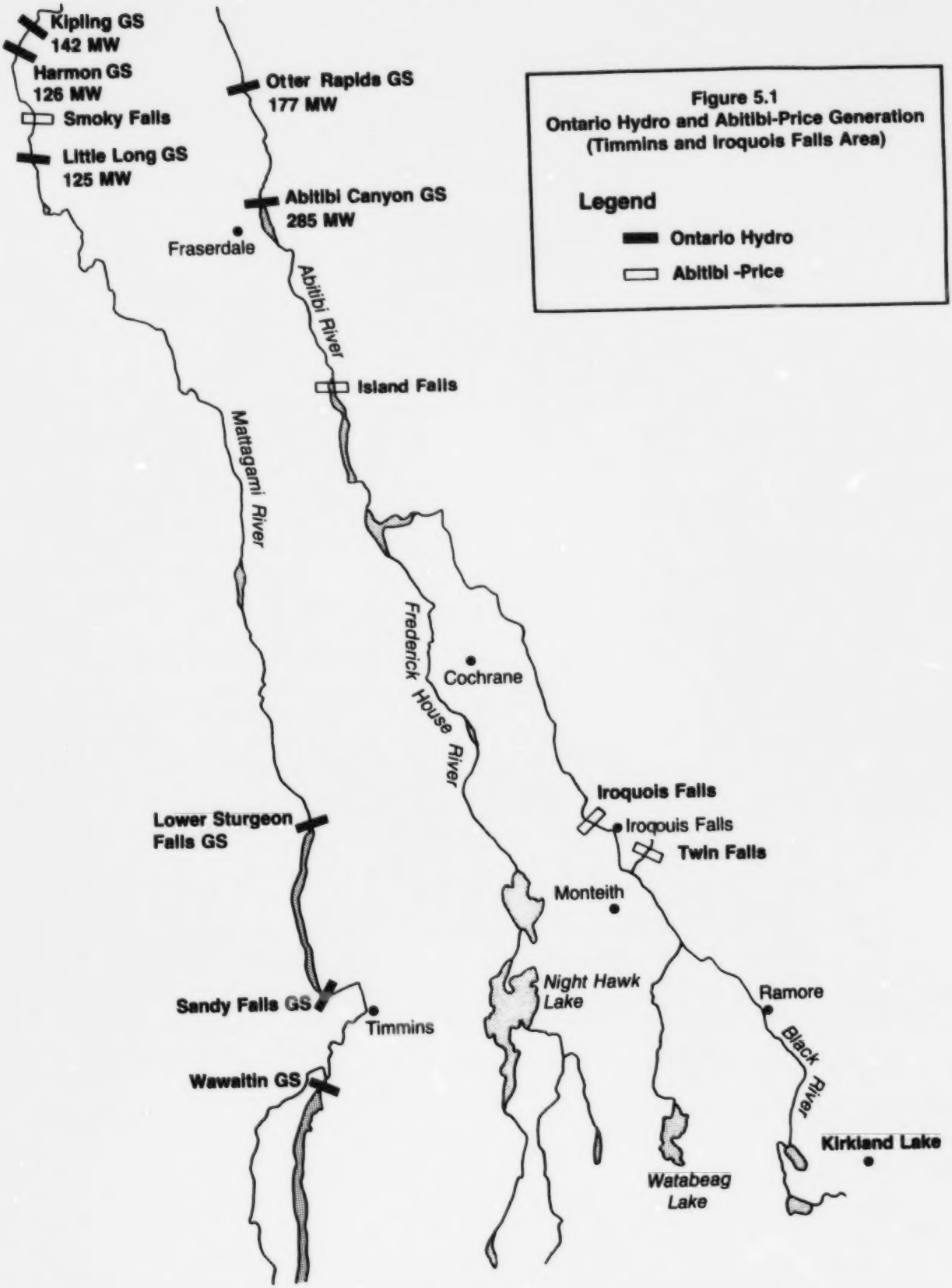


Figure 5.1
Ontario Hydro and Abitibi-Price Generation
(Timmins and Iroquois Falls Area)

RS168.LUEP.RA4.0027

Table 5.1
Northeastern Region
Net Annual Transfers of Electricity

Year	Import		Export		Comments
	M W H	% of Annual Consumption	M W H	% of Annual Consumption	
1950			3,366	0.2%	Des Joachims-NBay Tie In Service
1951			110,707	6.8%	
1952			105,800	5.8%	Otto Holden GS In Service – Partial
1953	26,540	1.4%	-		
1954	19,572	0.9%	-		Otto Holden GS In Service – Complete
1955	549,692	24.4%	-		
1956	521,437	21.2%	-		
1957	759,884	27.2%	-		
1958	1,099,669	36.2%	-		
1959	1,518,561	42.7%	-		
1960	1,357,163	37.3%	-		Red Rock GS In Service
1961	877,316	24.6%	-		Otter Rapids GS In Service
1962	749,367	21.0%	-		
1963	1,339,984	37.0%	-		Little Long GS In Service
1964	181,030	4.7%	-		
1965	-		125,767	3.2%	Harmon GS In Service
1966	-		852,953	20.8%	Kipling GS In Service
1967	-		1,991,790	42.6%	
1968	-		1,559,883	28.2%	
1969	-		2,045,707	39.4%	Aubrey Falls GS In Service
1970	-		1,172,788	19.2%	Wells GS In Service
1971	-		162,090	2.6%	Lower Notch GS In Service
1972	-		701,084	10.5%	
1973	-		519,182	7.2%	
1974	725,880	9.1%	-		
1975	1,610,154	20.6%	-		
1976	2,471,147	28.5%	-		
1977	2,328,924	27.0%	-		
1978	1,616,668	19.9%	-		INCO strike last quarter
1979	180,516	2.1%	-		High river flows and INCO
1980	2,494,910	26.4%	-		on strike for part of year
1981	2,901,756	27.9%			
1982	1,947,868	20.7%			INCO strike & layoffs

following is a brief history of the hydraulic generation development and associated transmission which has occurred in the Timmins, Iroquois Falls and Kirkland Lake area from 1910 to the present.

5.1.1 Generation and Transmission History in the Northeastern Region

The Northern Canada Power Company was the first to build generating stations and transmission facilities in both the Timmins and the Kirkland Lake - Cobalt areas.

In 1910, in the Timmins area, a power plant was built at Sandy Falls to supply mines at Hollinger, McIntyre and Vipond. Then in 1913, Wawaitin GS was constructed to supply the Dome mine. These two plants were connected to supply Schumacher and South Porcupine.

In 1923, the Lower Sturgeon Falls was developed and delivered power to Timmins. These generating stations are shown on Figure 5.1.

Further east, in the Kirkland Lake area in 1910, the same Company built the Matabitchuan GS on the Montreal River which supplied power to the mines in the Cobalt area. In 1914, the first mines were being developed in Teck Township. The first source of power was from a private plant, Charlton GS, on the Blanche River which supplied the Tough-Oakes mine. By 1917, this plant was inadequate and additional power was supplied from Cobalt. In 1920, Crystal Falls GS was built on the Sturgeon River by the Spanish River Pulp and Paper Company. There was further expansion in the area by the 1930s resulting in the construction of generating stations at Indian Chute, Hound Chute, Matabitchuan, Upper Notch and Fountain Falls, and the Quinze plants in Quebec. These supplied power to Schumacher and the Kirkland Lake area. These generating stations are shown in Figure 5.2.

The five plants in the Cobalt area generated 26 megawatts (MW), and the three plants west of Timmins generated 19 MW. In June 1923, the Northern Canada Power Company built the 115 kV two-circuit steel tower line from the Rapide des Quinze plant in Quebec northwest to Schumacher, a distance of over 200 kms. This is the abandoned line that runs southwest from Timmins west of Night Hawk Lake.

In 1930, the Ontario Power Service Corporation began construction of the Abitibi Canyon GS. However it went bankrupt, and the plant was taken over and completed by Ontario Hydro in 1933. At the same time, 115 kV lines were built from Abitibi Canyon through Timmins to Sudbury and also through Cochrane, Iroquois Falls, Kirkland Lake to New Liskeard.

In 1936, some loads in both the Timmins and Kirkland Lake areas were supplied in part by Ontario Hydro at 60 Hz (cycles per second frequency) and by the Northern Ontario Power Company (a subsidiary of Northern Canada Power Company) at 25 Hz. In 1944, Ontario Hydro purchased the Northern Ontario Power Company. In 1958, a frequency standardization program was completed that changed the frequency from 25 to 60 Hz. Over

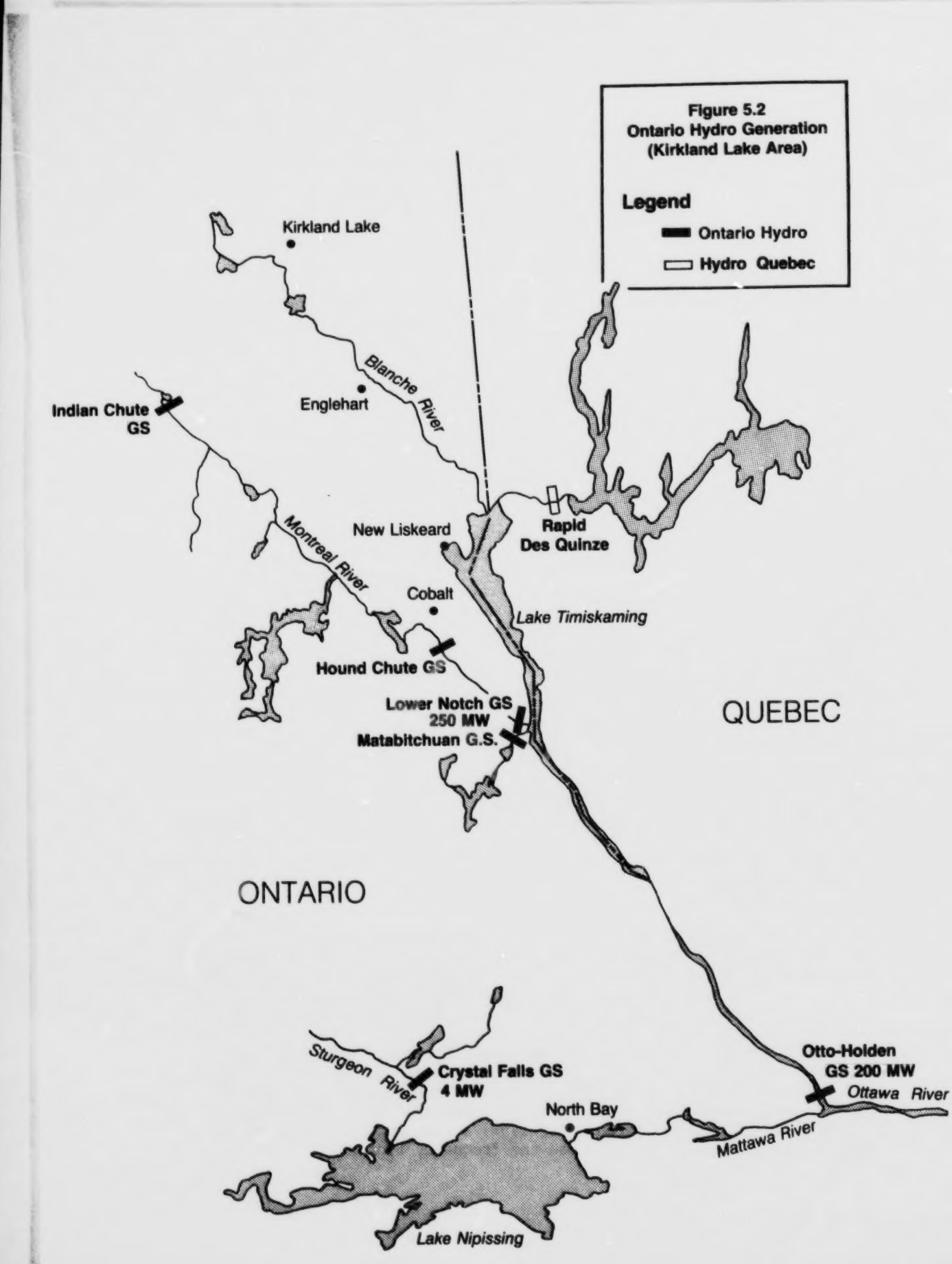


Figure 5.2
Ontario Hydro Generation
(Kirkland Lake Area)
Legend
Ontario Hydro
Hydro Quebec
Kirkland Lake
Englehart
Blanche River
Indian Chute GS
Montreal River
New Liskeard
Rapid Des Quinze
Cobalt
Lake Timiskaming
Hound Chute GS
Lower Notch GS 250 MW
Matabitchuan G.S.
QUEBEC
ONTARIO
Sturgeon River
Crystal Falls GS 4 MW
North Bay
Otto-Holden GS 200 MW
Ottawa River
Mattawa River
Lake Nipissing

100,000 pieces of electrical equipment and 20,000 domestic and commercial customers were changed. However, some mines continue to use a 25 Hz supply and consequently 115 kV lines at both 60 and 25 Hz are required.

The next major hydro-electric station to be built in the area was the Otto-Holden plant. This was completed in 1952. Then in 1958, Hydro began to build four more stations on the Moose River System. By 1966, Otter Rapids, Little Long, Harmon and Kipling generating stations were in-service and some of the units at Abitibi Canyon were modernized. The 500 kV transmission line linked these plants through Porcupine TS and Sudbury to Toronto.

Finally, in 1973, the Lower Notch GS was completed, and Dymond TS was placed in service. The 230 kV line to Dymond TS was completed in 1977.

In addition to the Ontario Hydro GSs, Abitibi Price Inc. has hydraulic generating stations at Smooth Rock Falls, Island Falls, Iroquois Falls and Twin Falls.

5.1.2 Existing Transmission Facilities

Figure 5.3 shows the existing transmission facilities in the east section of Ontario Hydro's Northeastern Region.

Under normal conditions, i.e., with all facilities in service, power is brought into the Iroquois Falls, Monteith, Matheson, Ramore, Kirkland Lake area from Dymond TS at New Liskeard and from Abitibi Canyon GS. The Kirkland Lake area is normally supplied from Dymond TS while the towns and villages of Cochrane, Iroquois Falls, Monteith, Matheson and Ramore are normally supplied from Abitibi Canyon GS. The Town of Kirkland Lake is also supplied from the Hunta SS to Kirkland Lake TS line when the 115 kV Dymond TS to Kirkland Lake TS is out of service.

A secure electrical supply is provided to the Timmins area by the two single circuit 500 kV lines from Pinard TS to Porcupine TS to Hanmer TS. These lines also tie into the southern Ontario system at Essa TS (near Barrie) and Kleinburg TS north of Toronto.

The 500 kV lines allow the transfer of hydraulic generation from the north to the south and as required, thermal, nuclear and hydraulic generation from the south to the north. Porcupine TS has transformers which convert the voltage from 500 kV to 230 kV and also from 500 kV to 115 kV. The 115 kV and the 230 kV supply to the Kidd Creek Met site comes from the 500 kV lines.

There is a 115 kV single circuit 25 Hz line from Abitibi Canyon GS past Cochrane, Iroquois Falls, Monteith SS, Ramore, and Kirkland Lake TS. The line then ties into the Hydro Quebec system near Rouyn. Also there is a connection to this line at Monteith SS with Timmins TS. The 25 Hz at Timmins TS incorporates 25 Hz generation, when available, from Sandy Falls GS and Lower Sturgeon GS. A 25 Hz 115 kV line continues from Timmins TS to Sudbury picking up Wawaitin GS on the way.

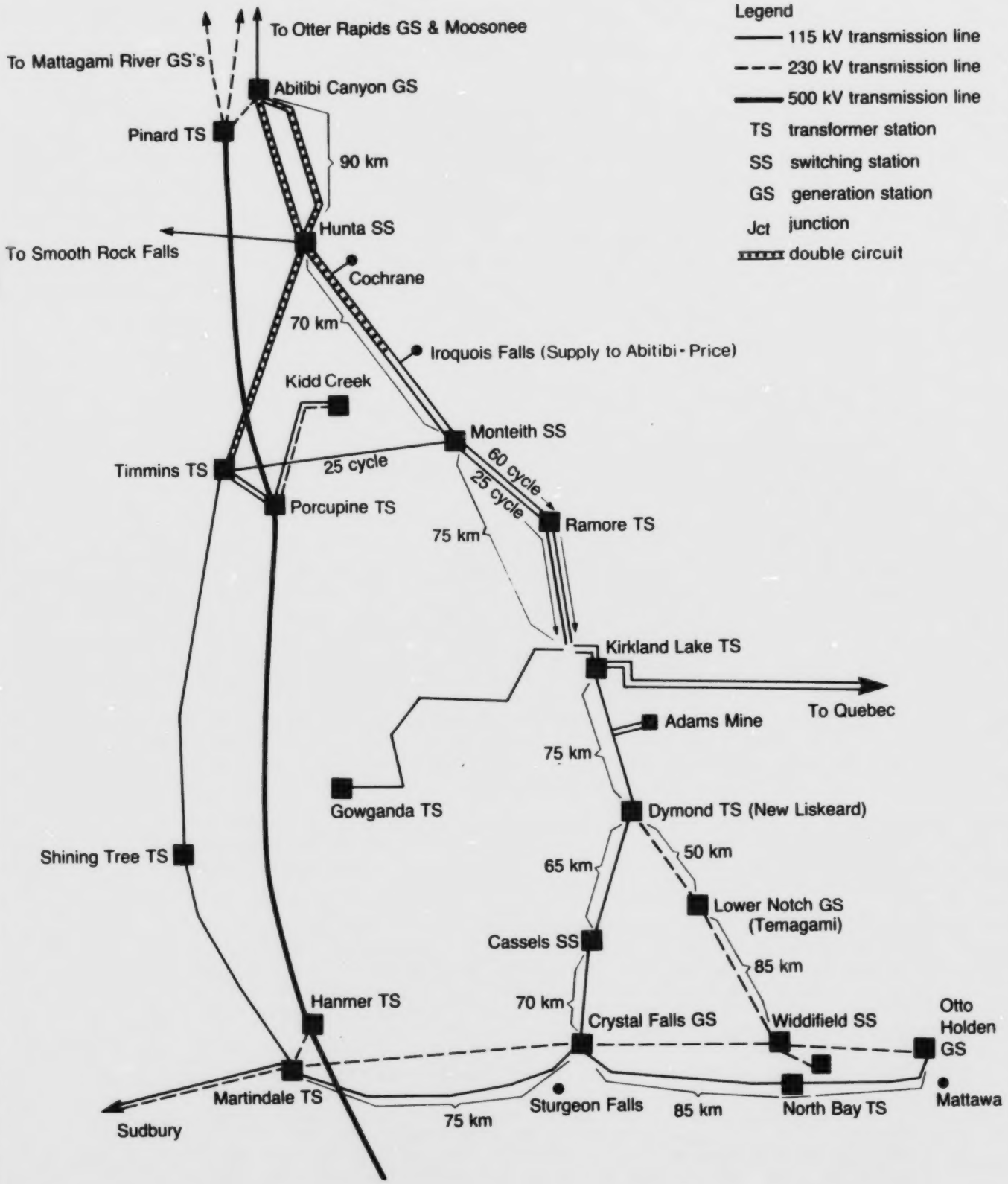


Figure 5.3
Existing Transmission Facilities in Northeastern Ontario

5.2 Need for Facilities

Abitibi-Price Incorporated have requested that Ontario Hydro supply an additional 68 MW of power at Iroquois Falls. The additional power is needed to supply a plant expansion and conversion to Thermal Mechanical Pulping (TMP) paper making process. The plant addition is scheduled for completion in February 1990.

The total peak demand supplied by Ontario Hydro at Iroquois Falls is 32 MW. This is in addition to 50 MW of existing water power generated by Abitibi-Price at Iroquois Falls and other sites. The Town of Iroquois Falls and surrounding area peak demand is 7 MW and is included in the 32 MW peak demand supplied by Ontario Hydro.

The existing 115 kV system has a net capacity of 38 MW available to supply Iroquois Falls, both the town and Abitibi-Price. After an existing 25 Hz transmission line from Timmins TS to Monteith SS is converted to 60 Hz operation in 1987, the capacity of the existing 115 kV system at Iroquois Falls will be 68 MW. The peak demand on the 115 kV system in 1990 at Iroquois Falls is forecast to be 108 MW if Abitibi-Price proceeds with their expansion plans. This magnitude of demand cannot be supplied by the existing 115 kV system.

5.3 Alternative System Plans

A discussion and evaluation of the alternatives to the undertaking is presented below.

5.3.1 Null Alternative

The Abitibi-Price Inc. plant expansion would not be possible without additional electrical energy. Failure to provide the necessary facilities ensuring a reliable source of electric power to meet the demands of industry is not compatible with the Ontario Hydro mandate.

5.3.2 Small Hydro-Electric Generation

Along the Abitibi River and its tributaries, there are locations at which new water power sites may be developed. Based on a 95 percent of time stream flow, there are 18 potential sites located within 60 km of Iroquois Falls. The energy potential of these 18 individual sites ranges from a low of 0 to a high of 4.4 MW. The total energy potential, available 95 percent of the time, if all 18 sites were to be developed; would be about 8.1 MW. At the 50 percent availability level this total potential increases to 41.2 MW.

The existing generating station at Iroquois Falls which is operated by Abitibi-Price Inc. has an installed capacity of 23.1 MW. This site is rated at 3.9 MW for 95 percent of the time. No additional energy potential is available at this existing site or the next closest existing

generating station at Twin Falls. The Twin Falls generating station has an installed capacity of 22.4 MW with 2.7 MW available 95 percent of the time.

The two closest undeveloped sites with potential for energy availability of more than 1 MW, 95 percent of the time are located more than 50 km from Iroquois Falls. Even if both sites were developed to their full potential, they would provide an additional 5.8 MW at 95 percent availability and 28.9 MW at 50 percent availability. Approximately, 25 km of transmission line would be needed to connect both these sites to the existing 115 kV system near Cochrane.

The cost to develop only these two largest sites to provide much less than the needed 68 MW would be substantially greater than any transmission line connecting the 500 kV grid to Iroquois Falls. The alternative to build new hydro-electric generation to supply the electrical needs of Abitibi-Price Inc. was rejected because of limited availability and the extremely high cost in comparison to other alternatives.

5.3.3 Alternative Energy Technologies

Ontario Hydro continuously investigates alternative energy technologies such as fuel cells, solar power, wind power, burning of municipal waste, timber or bio-fuels and industrial co-generation. Some of these technologies, fuel cells, solar power and wind power are either not sufficiently advanced or are much more costly than the alternatives of burning municipal waste, timber or bio-fuels, the establishment of industrial co-generation, or the construction of new transmission lines. As a result, fuel cells, solar power and wind power were rejected from consideration.

Abitibi-Price have advised us that in their view, industrial co-generation and burning of timber or bio-fuels are not economically acceptable to them. They are converting their existing plant to the TMP process to increase overall plant efficiency to remain competitive in the market for paper products. Their plans do not include large expenditures of capital to include construction of additional generating equipment at their plant site in Iroquois Falls.

An energy from waste alternative in combination with timber or bio-fuels may be possible in this location. However, the capital and operating costs of such a generating station at Iroquois Falls are substantially higher than building a new transmission line from the existing high voltage system. The alternative to consider building an energy from municipal waste facility was rejected because there is insufficient quantity of municipal waste to fuel a generating station which could reliably supply 68 MW.

Even if sufficient timber or bio-fuels were available to burn in combination with municipal waste, the alternative to construct a thermal generating station would be rejected because of the high cost compared to building a 50 km transmission line.

5.3.4 Improve Existing 115 kV System

The existing 115 kV system in the Iroquois Falls area cannot be upgraded further except as described in Section 5.2. Although converting the 25 Hz loads to 60 Hz in Kirkland Lake and utilizing the existing 25 Hz lines for 60 Hz operation was also considered, it would not provide a significant increase in capacity to supply Abitibi-Price Inc.

5.3.5 New 115 kV Supply

A new 115 kV line could be built from either Abitibi Canyon GS, Dymond TS or Porcupine TS. The alternative of supplying from Dymond TS or Abitibi Canyon GS would involve construction of a 115 kV line either 165 km or 145 km long respectively. Both these sources of 115 kV supply would be substantially farther than a supply from Porcupine TS which would result in the need for a 115 kV line approximately 66 km long or less than half the length of line required to connect the other sources.

5.3.6 New 230 kV Supply

As mentioned in Section 5.1.2, Kirkland Lake is normally supplied from Dymond TS in New Liskeard while Iroquois Falls and Matheson are usually supplied from Abitibi Canyon GS. These are two possible points of supply to Abitibi-Price Inc. In addition, there is an obvious point of supply from the Timmins area which has the 500 kV station Porcupine TS. This station supplies the Kidd Creek Met Site via a 230 kV single circuit wood pole line which could be tapped to supply Abitibi-Price Inc.

The alternative of supplying from Dymond TS would involve construction of a 230 kV single circuit line approximately 165 km long and another 230 kV single circuit line from Dymond TS to Widdifield SS (approximately 135 km). The section Dymond TS to Widdifield SS would be required as back-up for the existing 230 kV line. This alternative would involve construction of approximately 300 km of line (versus the preferred alternative total length of 50 km). It is obviously not economic and would have greater overall environmental and social impact because of the much longer line length.

Similarly, the alternative of supplying from Abitibi Canyon would involve construction of approximately 145 km of line which would be expensive to build and have greater overall environmental and social impact.

6.0 RATIONALE FOR SELECTION OF SYSTEM PLAN

The system options for providing an adequate electrical energy supply were evaluated. This section provides the rationale for selecting a 230 kV single circuit transmission line from the 230 kV system in Timmins to supply Abitibi-Price Inc. in Iroquois Falls.

The null alternative was not feasible because plant expansion is not possible without additional energy supply. This, of course, would have negative consequences for the industry.

There is the potential for some small hydro-electric generating stations (3 to 10 megawatt) on rivers in the area. However, the high costs of these stations for the limited amount of electricity supplied make this alternative unacceptable as a means to supply the plant expansion. Other alternative energy technologies such as fuel cells, solar power, wind power, municipal waste, timber or bio-mass fuels, industrial co-generation and district heating are continously being investigated, but, at present, they are either not sufficiently advanced or too expensive to be used instead of a new electrical supply from the existing system. Therefore, these alternative technologies were rejected.

The reinforcement of the existing 115 kV system by either upgrading or constructing a new 115 kV line was also considered. The existing 115 kV transmission system will be upgraded to the maximum extent possible by 1987, as described in Section 5.2.

The closest source of 115 kV power on the existing electrical supply system is Porcupine TS in Timmins. A new 115 kV line to Abitibi-Price Inc. from this source would be at least 66 km long, approximately 32% longer than a 230 kV line tapping the existing transmission line to the Kidd Creek Met Site. The 115 kV line alternative would be more expensive and would provide less than half the capacity of a 230 kV line. A supply at 115 kV was rejected for these reasons and because there would be little or no excess capacity for future expansion beyond 1990 by Abitibi-Price Inc.

Thus for cost, environmental and engineering reasons, the recommended alternative is the construction of a 230 kV single circuit transmission line from the Timmins area to Iroquois Falls.

7.0 ROUTE SELECTION PROCESS

7.1 Overview

The route selection process for the 230 kV transmission line (Figure 7.1) took into account environmental, engineering, cost and socio-economic considerations. It also involved the public to ensure that a wide range of criteria, including the values and concerns of area residents, were considered in identifying and assessing possible route locations and in selecting a preferred route. The route selection process was aimed at identifying environmental constraint areas while increasing the level of detail of information, as various route possibilities were identified and evaluated from technical, cost, environmental and social perspectives.

7.2 Environmental Study Process

The main steps of the process were:

(a) Develop the study area and external contacts

The study area boundaries were identified from a reduction in area of the previous Supply to Kirkland Lake study. Government agencies, local municipalities, MP's, MPP's, and the public were informed of the study.

(b) Update data

Land use and environmental information from the Supply to Kirkland Lake study was updated from a variety of external sources. Field checks were also carried out where necessary. Technical information was gathered and appropriate updates were made.

(c) Identify constraints

Ontario Hydro reviewed the potential impacts of transmission line construction, operation and maintenance on the land use and environmental resources. The "objective statements" developed during the Supply to Kirkland Lake study were used to describe the potential problems with and the reasons why various resources should be avoided when locating alternative routes. Cost and technical constraints were also identified.

(d) Develop constraint map

During the Supply to Kirkland Lake study, the citizens' committee ranked the environmental objectives in the order they should be avoided when identifying alternative routes. The results of this ranking exercise were applied to this study with some revisions to conform with the smaller study area and to place greater emphasis on existing development. The ranked objectives were then grouped into five categories and a constraint map was produced to reflect the top four levels of environmental constraint.

FIGURE 7.1

Route Selection Process

(a) Develop Study Area and External Contacts

(b) Update Data

(c) Identify Constraints

(d) Develop Constraint Map

(e) Identify Alternative Routes

(f) Evaluate Alternative Routes

(g) Compare and Select Preferred Route

(e) Identify alternative routes

A number of alternative routes were identified using the constraint map, a set of route identification criteria, technical considerations and public comments. These routes avoided areas of high constraint where possible. Municipal and provincial government representatives were contacted and a public information center was held in Iroquois Falls to display the alternative routes and to obtain public feedback.

(f) Evaluate alternative routes

All of the alternative routes were evaluated on a link by link basis in relation to environmental, technical, cost and socio-economic considerations. The evaluation results for each link formed the basis for the subsequent comparison of alternative routes.

(g) Compare and select preferred route

Based on the evaluation, initial comparisons were made between links having common end points. Preferred links were then selected. The next level of comparison involved sub-routes having common end points whereby

the preferred sub-routes were selected. With the preferred links and sub-routes selected, two alternative routes were left to compare against each other. This final comparison resulted in the selection of a preferred route.

A public information centre was held in Iroquois Falls to obtain comments on the preferred route from the potentially affected property owners, area residents, interest groups, and external agencies.

7.3 Public Involvement Program

The program was aimed at ensuring that the interests of the public were identified and considered throughout the planning process.

The objectives of the program were:

- to inform local elected and appointed officials, interest groups and area residents of the study, purpose, scope and type of public involvement program to be undertaken;
- to continue to keep the community and other interested parties informed of the progress of the study and to provide information on request throughout the study duration;
- to encourage a two-way dialogue between Hydro and the public and provide opportunities for people to participate in the study;
- to identify all those with concerns at the earliest possible point in the study; and
- to ensure all concerns are considered by Ontario Hydro and incorporated into the study where possible.

7.3.1 Incorporation of Supply to Kirkland Lake Citizen's Committee Results

The Supply to Kirkland Lake Area transmission line study commenced in September 1981. Two citizen's committees were formed - one based in Timmins and the other in Kirkland Lake. By November 1982, seven committee meetings had been held which resulted in the ranking of environmental resource data. A list of the committee members is included in Appendix B1.

Information gathered from the local citizens' committees involved in this previous study was reviewed and incorporated. The information played a key role in ranking the resources referred to in the route selection process and resulted in determining which alternative route would be preferred.

7.3.2 Public Notification

The public was notified of the study through letters sent in mid-October. A list of the publics contacted is included in Appendix B2.

The local media was contacted and notified of the study through a press release, newspaper advertisements and television. See Appendix B3 for a summary of these.

Public information centres were held first to present alternative routes in December 1985 and, second, in April 1986, to present the recommended route. The affected property owners and the public were invited through letters and newspaper advertisements.

7.4 Socio-Economic Assessment

7.4.1 Social Environment

In general, the assessment of socio-economic impacts involves describing the social environment, predicting what will change as a result of the transmission line, evaluating the extent of these changes, and recommending mitigation measures where these are required. The socio-economic assessment constitutes a small component of the environmental analysis. Consideration for socio-economic impacts was given at each stage of the route selection process.

The communities in the study area were described in terms of population characteristics, local economy, labour force, and local community goals. Sources of information were official plans, census data, minutes of the Supply to Kirkland Lake Citizens' Committee meetings, public information centres, and provincial ministry staff. This information was used to predict potential effects and evaluate their significance.

7.4.2 Socio-Economic Criteria

From previous socio-economic assessments of transmission facilities, four criteria were developed to evaluate the socio-economic effects:

- The ability to handle change. This relates to the capability of the communities to adapt to change. Indicators were age, rate of population growth and development orientation. The premise is that young, fast-growing communities which encourage development are likely to be more receptive to change than older, slower-growing, less development-oriented communities.

- Compatibility with the community. This refers to the compatibility of transmission lines with the character of the community. Although few communities would encourage the presence of transmission lines, certain communities would be more amenable to transmission lines than others; for example, urban areas are likely more receptive than rural farm areas, than rural non-farm areas, than rural estate areas. Indicators such as proportions of urban and rural population, and occurrence of rural residential development were used.

- Economic Base Change. This reflects the relative change associated with the transmission lines. Indicators relate to the loss in value of land taken out of production, effects on industry, and relocation of business for example.

- Social/Lifestyle change. This refers to the qualitative changes, real or perceived, which could occur if transmission lines are built. Indicators were the extent to which the right-of-way would open up areas, creating new access, and changes to the character or use of a community such as being divided by a line, or creating reduction in enjoyment by the community as a result of the line.

7.5 Provincial Government Ministry Involvement

The provincial government ministries were involved in the study by providing data, commenting on the study process and reviewing the draft EA. This process follows the Guidelines for Pre-submission Consultation issued by the Ministry of the Environment. These guidelines suggest that the proponent consult with all ministries and government agencies who will be participants in the formal review and decision making process.

During October and November of 1985 local ministry offices were contacted to advise them of the study and to obtain or verify environmental data. In December a meeting was held for EA reviewers to discuss the following points:

- need,
- study schedule,
- selection of preferred system option,
- study process, and
- alternative routes.

In March 1986 a draft of the Environmental Assessment was sent to all EA Reviewers for their comments. The participating ministries are listed in Appendix B4.

8.0 DESCRIPTION OF THE ENVIRONMENT

8.1 Development of the Study Area

The study area boundaries are shown in Figure 8.1. The primary objective in developing the study area was to include sufficient geographic area for the identification of viable alternative routes north and south of Frederick House Lake from the Timmins area to the Abitibi-Price Inc. pulp and paper mill in Iroquois Falls.

Beginning at Porcupine TS east of Timmins the northern boundary follows the 115/230 kV right of way in a northeasterly direction. In Whitney Township, the boundary turns north and then northeast in Gowan Township until it reaches McCart Township. At this point, the study area

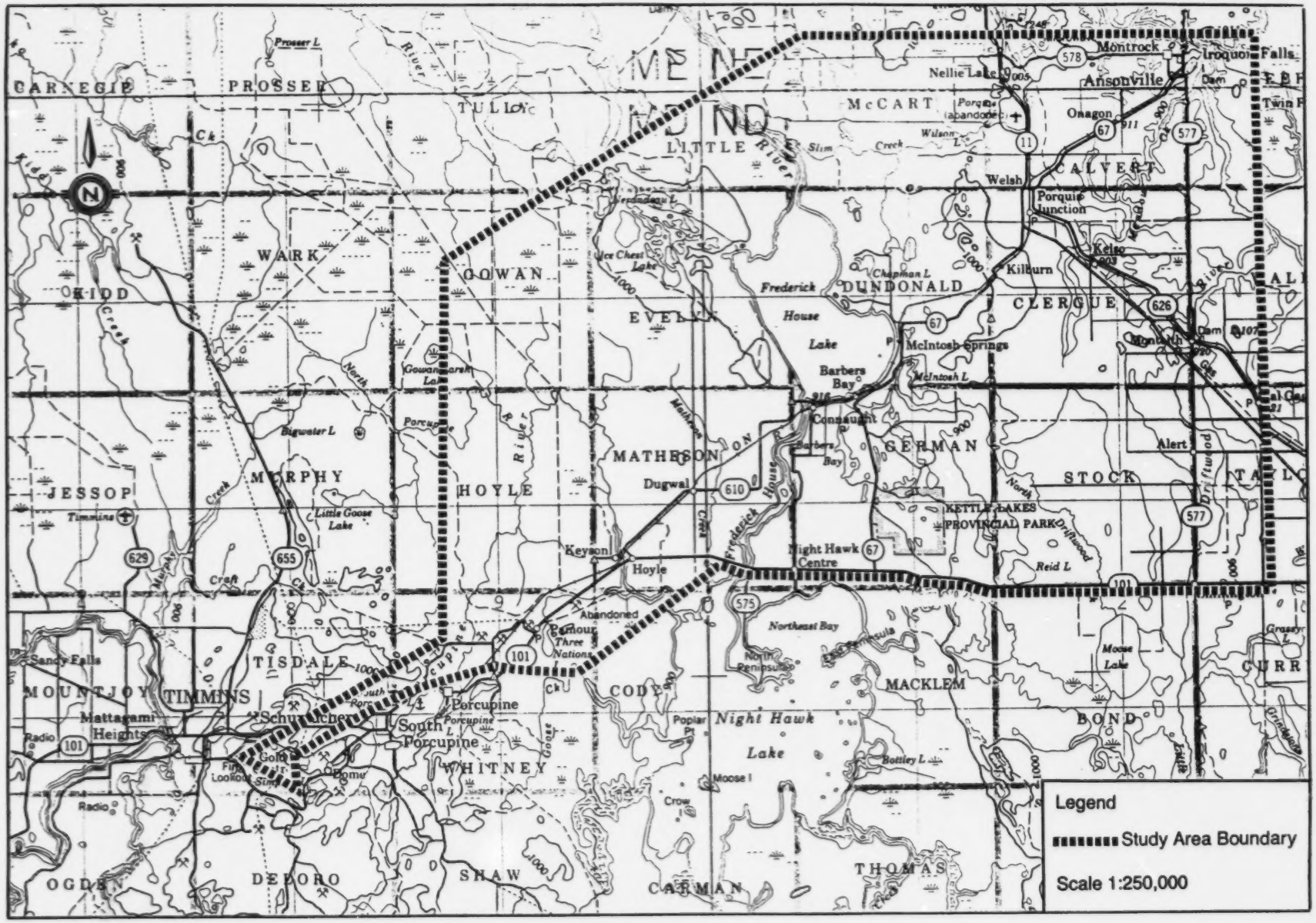


Figure 8.1
Study Area

RS-283-LUEP-RA6-0002

boundary runs east to Iroquois Falls. This northern boundary was established to allow for alternatives around the north end of Frederick House Lake.

The southern boundary of the study area also follows the high voltage lines east of Porcupine TS. The south boundary then follows the 25 Hz 115 kV transmission line in an easterly direction until it reaches Highway 101 at the Frederick House River crossing. At this point, the boundary leaves the 115 kV line and follows Highway 101 to the first road intersection east of Shillington. The boundary then turns north until it reaches Iroquois Falls. The southern boundary was developed to utilize the 115 kV 25 cycle line east of Porcupine TS and to allow for routing possibilities as far south as Highway 101, east of Night Hawk Lake.

8.2 General Description of the Study Area

The study area consists of a variety of natural and man-modified environments. Consequently, the range of environmental effects associated with the construction and operation of a transmission line through this area is also expected to vary. The following provides a general description of the natural and social environment features contained within the study area.

8.2.1 The Environment

The bedrock within the study area is important, as a source of minerals. Differences in the bedrock are reflected in the topography and the patterns of rivers and streams. The bulk of the bedrock consists of deformed volcanic and ancient sediments.

Variations in soil, climate and drainage control the type and distribution of vegetation. The low lying, poorly drained areas are generally dominated by black spruce. The well drained, sandy soils associated with the eskers and glacial outwash support stands of hardwoods such as aspen and birch as well as some conifer species such as red, white and jack pine. In areas of glacial till materials, forest composition is variable, consisting of balsam fir, black and white spruce, white birch and aspen.

A variety of wildlife species inhabit the study area due to differences in natural and disturbed habitats. Moose are found throughout the area and require a diversity of habitat types such as aquatic plant communities and young decidious forests for food, and stands of black spruce and jack pine for shelter. Black bear are also prevalent in a variety of natural habitats and can also be seen frequenting local waste disposal sites. One of the most abundant fur bearing animals present is the beaver. Signs of its effect on aquatic environments and adjacent landscapes are readily noticed throughout the study area. The most common small game species are snowshoe hare, ruffed grouse, spruce grouse and woodcock.

RS108-LUEP-RA4-0027

Waterfowl populations make up an important segment of the study area wildlife resources. Resident species inhabit shallow lakes and slow-flowing streams and rivers during summer. Other non-resident species use certain portions of the study area during the migratory periods. The major waterfowl production and staging areas are located on the Frederick House and Porcupine rivers.

The abundance of lakes, rivers and streams contain a wide variety of fish species such as yellow pickerel, northern pike, smallmouth bass in addition to brook and rainbow trout.

Mining, forestry, industrial development, transportation, communications, agriculture, and the growth of villages, towns and cities have all contributed to changing the face of the land. Yet man has been active in the area for many thousands of years preceding these more obvious effects. Archaeological sites dating back 11,000 years are found throughout the area, particularly near lakes and rivers. The fur trade era which began in the mid-seventeenth century served to open the interior.

Development of the mining industry began in the early 1900's. The rapid growth of gold mines in the Porcupine area, stimulated growth in other sectors, such as timber harvesting and agriculture. The Kidd Creek Mill, Pamour and Dome mines are some of the major industries operating in the Timmins area. New mining developments such as the Quebec Sturgeon and Bell Creek mine operations along with active mining exploration activities reflect the mineral potential of the area, especially for precious metals such as gold.

Many localized timber harvest areas occur throughout the study area such as the Ice Chest Lake area, the area around Kettle Lakes Provincial Park, and areas east and west of Highway 11 near Iroquois Falls. Results of the Ministry of Natural Resources reforestation program are clearly evident with many of the areas showing good rates of survival and growth.

The area from Night Hawk Lake to Shillington and north to Iroquois Falls is dominated by clay-based soils. Agriculture is the primary land use. Dairy products, beef cattle, feed grains and vegetables are produced mainly for local markets. Matheson and Ramore, near the study area, are the main local centres and provide goods and services to the agricultural community surrounding them.

Sand and gravel extraction also occurs along the eskers and outwash areas. However, a large number of the quality aggregate deposits are considerable distances away from the demand centres.

Commercial fur harvest activities take place throughout the study area. Due to its prolific nature and attractive pelt, beaver contributes the largest portion of the commercial fur harvest in the area. The next most important commercial fur species harvested are marten, muskrat, lynx and coloured fox.

Tourism and outdoor recreation have become increasingly more important throughout the study area. The major activities which take place are hunting, fishing, cottaging, camping, boating, swimming, canoeing, hiking, snowmobiling and wildlife viewing. Concentrated areas of outdoor recreation are found at Kettle Lakes Provincial Park, and Frederick House and Nellie Lakes.

8.2.2 Social Environment

The study area includes parts of three municipalities: the City of Timmins, the Town of Iroquois Falls and the Township of Black River - Matheson. Since only a small uninhabited portion of the Township of Black River - Matheson is involved, the description of the social environment focuses on the two larger communities of Timmins (1985 population of 44,743) and Iroquois Falls (1985 population of 6,230).

The majority of residents live and work in the built-up urban areas of Timmins and Iroquois Falls. There are also two small communities in the Town of Iroquois Falls - Monteith and Porquis Junction. The remaining population live in farms or homes scattered along rural roads.

Timmins was founded with the development of the mining industry in the early 1900's. Mining continued to be a major factor in the steady growth of the area. In 1973, Timmins amalgamated with the surrounding townships to become the City of Timmins, one of the largest in area (at 1,240 square miles) in the world. The City has become a regional centre for the surrounding communities, demonstrated by the high proportion of the labour force employed in service industries (26 percent) and trade (17 percent). A significant portion of the labour force (23 percent) remains employed in the mining industry. The participation rate of 76.1 percent for males aged 15 years and over in the labour force, is only slightly less than the Ontario average. The unemployment rate is slightly higher at 5.3 percent. The average family income for 1981 was $25,982.

The City of Timmins is bilingual with 38 percent of the population French, 52 percent English, and only 10 percent claiming another language as their mother tongue. The population in general is somewhat younger than the Ontario average with a greater population under 15 years of age.

Population growth has been very stable over the past ten years with a modest 1.7 percent increase overall. The City is planning for moderate growth to be within existing built up areas in order to minimize the cost of providing services and to maintain the surrounding undeveloped area - the latter being particularly valued for outdoor recreation and tourism. There is recognition that natural resources, principally the mining economy, have supported the City in the past and that they should be protected in the future.

Iroquois Falls, one of the first planned new towns in Canada, was incorporated in 1915. It is a company town, originally owned and designed by Abitibi-Price Inc., a paper manufacturing company. The built-up area of the Town is made up of the original communities of Iroquois Falls, Ansonville and Montrock, which remain separated by the railway line and are considered to be quite separate communities. After several amalgamations with nearby townships over the years, the Town now combines seven geographic townships, a few of which are uninhabited. The urbanized core is located adjacent to the Abitibi-Price plant.

The local economy remains dependent on Abitibi-Price. Forty-six percent of the labour force is directly employed in manufacturing, mainly at the plant, but many of the local businesses and services are dependent on the existence of the company as well. The participation of males in the labour force is the same as for Timmins, and the unemployment rate is even lower at 3.5 percent. This may mean, however, that the unemployed are more likely to move out of the community in search of work. The average family income at $27,015 in 1981 is slightly higher than that of Timmins. The ratio of residential to commercial, industrial and business tax assessment of 36 percent to 64 percent illustrates the dependence of the municipality on Abitibi-Price for revenue.

In terms of population characteristics, Iroquois Falls is more French than Timmins, with a 47/50 percent split between French and English residents, and also has a somewhat younger population than the Ontario average.

The Town of Iroquois Falls experienced significant decreases in population size in the mid 1970's which have resulted in an 8 percent drop overall in 10 years. Smaller decreases have occurred in recent years. With the Town so heavily dependent on Abitibi-Price, it is recognized that future company expansions involving automation may result in decreased manpower requirements. The Town is not anticipating significant future growth but whatever there is can be accommodated in the existing built-up areas. The surrounding undeveloped area will be protected for Abitibi-Price needs and outdoor recreation.

9.0 IDENTIFICATION OF ROUTE ALTERNATIVES

9.1 Collection and Updating of Data

To identify the land use and environmental concerns within the study area, the relevant data previously collected from the Supply to Kirkland Lake study was used as the starting point. Within the context of the present study, this data was reorganized under seven factor categories. Most of the data was obtained from the Ministry of Natural Resources, the Ministry of Agriculture and Food, the Ministry of Citizenship and Culture, the Ministry of Revenue, the City of Timmins, the Corporation of the Township of Black River - Matheson, the Town of Iroquois Falls, the Timmins Museum, private industry, interest groups and local individuals.

To ensure that the data was complete, up-to-date and accurately mapped, meetings were held with the source agencies and local individuals. Field checks were also conducted along all of the public roadways throughout the study area. In addition, 1984 Ontario Basic Mapping aerial photography was obtained to identify any recent land use changes on the landscape in areas not visible from roadways.

The following provides a general outline of the kinds of data considered within each factor:

Human Settlement

- considered existing and proposed land uses and buildings in addition to official plan designations and zoning by-law provisions.

Agricultural Resources

- considered active and dormant agricultural land in addition to other areas with suitable soils for agricultural production.

Forest Resources

- considered areas of present and future forest production including management areas; and existing forest cover with respect to the alternative routes.

Biological Resources

- considered cold and warm water fisheries, waterfowl habitat, moose aquatic feeding areas, moose wintering areas and sensitive wildlife habitats.

Recreation Resources

- considered public and private parks, camps, resorts, cottages, lodges, marinas, remote roads, canoe routes and outdoor recreation oriented viewsheds.

Heritage Resources

- considered known archaeological sites, historical sites and trails, and areas of high potential for containing archaeological sites.

Mineral Resources

- considered active and dormant mine operations, areas of proposed development and areas of high mineral potential, public and private sand and gravel pits in addition to aggregate reserve areas; and

- considered unique geological features.

For a detailed list of data types and their sources, refer to Appendix A1.

9.2 Development of Environmental Objectives

After the data collection and update phase, the data types within each factor which were similar in type, importance and expected impact were grouped together. In order to better describe these grouped data types from an environmental impact perspective, objective statements were developed for each group under the following headings:

- Environmental Objective
- Value of the Resource
- Potential Change to the Resource
- Possible Mitigation Measures
- Net Impact

During the previous Supply to Kirkland Lake study, 31 objective statements were developed. Of those, 30 were applicable to the present study. The data types represented by the 30 objective statements were examined further and regrouped to better reflect the areas of concern within the present study area. This gave rise to a final set of 25 objective statements. For a definition of each objective statement, refer to Appendix A2.

9.3 Development of Constraint Map

Prior to the development of a constraint map, it was necessary to rank the environmental objective statements in their order of priority to avoid. The original ranking of environmental objectives by the Supply to Kirkland Lake study citizens' committees was applied to the 25 objective statements developed for this study. The 25 ranked environmental objectives were categorized into five levels of constraint. The top four levels were used to develop the constraint map. The fifth (lowest) level was not used because many of the environmental objectives covered very large geographic areas. Since the primary purpose of developing a constraint map was to assist in the identification of alternative routes, inclusion of the fifth level of constraint would not have proven to be of any assistance. It should be noted, however, that during the evaluation of alternative routes all of the land use and environmental resources associated with the 25 environmental objectives were considered. Table 9.1 provides the ranked order of the 25 objectives and the level of constraint associated with each.

The resultant constraint map depicting the top four levels of constraint is shown in Figure 9.1.

9.4 Identification of Alternative Routes

Route identification criteria were developed based on environmental, technical and cost considerations. These criteria are as follows:

- parallel existing transmission lines, railways and gas pipelines where possible;
- locate right-of-way alignment along property boundaries or parallel to property fabric where possible;
- locate near existing access where possible;
- avoid crossing lakes and large wetland areas;
- cross roads and rivers at right angles where possible; and
- minimize the number of large angles in the right-of-way

The constraint map formed the basis for locating relatively low constraint areas or pathways for route identification and the route identification criteria served as guides for refining the routes. In some cases, it was necessary to cross areas of higher constraint but when this occurred, the routes were adjusted to cross the constraint with the least amount of impact. The alternative routes identified are shown on Figure 9.2 (in map pocket).

TABLE 9.1 - RANKED OBJECTIVE STATEMENTS AND LEVELS OF CONSTRAINT

LEVEL OF CONSTRAINT	RANKED ORDER	DATA TYPES WITHIN EACH OBJECTIVE BY FACTOR	
I	1	Human Settlement	- existing residential, institutional, commercial and industrial buildings including outbuildings - seaplane bases and airfields - cemeteries
	2	Recreation Resources	- Kettle Lakes Provincial Park and nature reserves - outposts camps, hunt camps and remote cottages - resorts, lodges, youth camps and cottages - local parks, camp grounds, marinas and access points
	3	Heritage Resources	- known archaeological and historic sites
	4	Agricultural Resources	- active and dormant agricultural lands
	5	Biological Resources	- sensitive areas as identified by the Ministry of Natural Resources
II	6	Agricultural Resources	- soils critical for agricultural development
	7	Biological Resources	- cold water sports fish habitat
	8	Forest Resources	- regeneration areas
	9	Human Settlement	- areas designated for residential and institutional development
III	10	Heritage Resources	- areas of high archaeological potential - historic trails
	11	Mineral Resources	- active and dormant mines and areas of proposed devlopment - active and dormant private, M.T.C., M.N.R. and municipal pits - aggregate reserves as identified by the Ministry of Natural Resources

LEVEL OF CONSTRAINT	RANKED ORDER	DATA TYPES WITHIN EACH OBJECTIVE BY FACTOR	
	12	Biological Resources	- moose aquatic feeding areas with high and medium potential
	13	Recreation Resources	- viewsheds of canoe routes and remote roads in parallel situations
IV	14	Human Settlement	- areas designated for commercial industrial development
	15	Mineral Resources	- unique geological features
	16	Biological Resources	- waterfowl production and staging areas
	17	Biological Resources	- moose wintering areas
V			
	18	Human Settlement	- designated hazard lands
	19	Agricultural Resources	- soils supplementary for agricultural development
	20	Forest Resources	- areas designed for harvesting to year 2001
	21	Biological Resources	- warm water fish habitats
	22	Mineral Resources	- areas with a high mineral potential
	23	Forest Resources	- high capability lands for forest production
	24	Mineral Resources	- critical aggregate areas
	25	Mineral Resources	- significant aggregate areas

10.0 EVALUATION AND COMPARISON OF ALTERNATIVES AND SELECTION OF THE PREFERRED ROUTE

The next step in the route selection process was to evaluate each of the alternative route links from environmental, technical, cost and socio-economic perspectives.

The environmental evaluation examined the effect each link (eg. AB, EF, GH, etc.) had on the various land use and environmental resources identified and mapped during the data collection step of the study. These resources or situations, were organized under seven factor categories; namely, (a) Human Settlement, (b) Agricultural Resources, (c) Forest Resources, (d) Biological Resources, (e) Recreation Resources, (f) Heritage Resources, and (g) Mineral Resources. A total of 48 environmental data types were considered in this evaluation.

The manner in which the environmental effects were described depended on the nature of the environmental resource being affected. The units of measurement used in the tabulation of route evaluation information were either length (km), area (ha), or frequency of occurrence (no.).

A total of 10 cost and technical considerations were also identified and were expressed in the form of length (km), frequency of occurrence (no.), or estimated cost (dollars). All cost figures are presented in 1986 dollars and include both facilities and property cost.

The socio-economic evaluation was qualitative and served to supplement the environmental considerations. The links were evaluated in terms of their potential for creating impacts on the local community. Four general socio-economic considerations were used: the ability of the community to handle change; compatibility of the line with the character of the community; changes to the economic base; and, social/lifestyle changes. Where potential socio-economic impacts were identified, they were factored into the evaluation.

The quantitative results of the route link evaluation are shown in Table 10.1.

The process of evaluating and comparing alternative routes and selecting a preferred route began with an evaluation of route links from environmental, technical, cost and socio-economic perspectives. The results of this evaluation formed the basis for a three step comparison and selection process as follows:

Step 1 - Alternative Link Comparison and Selection - this involved comparing route links having common end points and selecting the preferred link within each comparison.

EVALUATION TABLE

DATA TYPE	ROUTE LINKS														
	AB	DB	BL	LC	LN	EF	FH	NI	FG	GH	GHe	HI	IJ	JC	JK
HUMAN SETTLEMENT															
HOME REMOVALS (#)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HOMES WITHIN 75m (#)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
COMMERCIAL/INDUSTRIAL (#)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
PROPERTIES AFFECTED (#)	25	14	1	36	13	44	18	8	11	6	12	22	4	2	2
DIAGONAL TO BOUNDARY (Km)	19.4	15.4	3.0	15.0	-	20.2	12.1	3.0	5.1	6.5	4.9	1.6	2.0	1.5	0.6
PARALLEL TO BOUNDARY (Km)	2.9	3.5	-	6.1	11.0	0.5	-	2.6	-	-	-	-	-	1.6	-
ON OR ADJACENT TO BOUNDARY (Km)	-	-	-	8.8	8.4	3.1	2.6	-	-	-	3.2	7.8	-	-	-
PARALLEL EXISTING R/W (Km)	-	-	-	4.9	-	17.1	-	-	5.1	-	4.9	-	-	-	-
DESIGNATED RESIDENTIAL/INSTITUTIONAL (Km)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DESIGNATED INDUST/COMMERCIAL (km)	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-
DESIGNATED COTTAGE AREA (km)	1.0	0.8	2.2	-	-	1.8	-	-	-	-	-	-	-	-	-
DESIGNATED HAZARD LAND (Km)	-	-	-	8.1	3.9	-	3.9	1.3	-	3.0	-	4.2	-	-	-
AGRICULTURAL RESOURCES															
ACTIVE AGRICULTURAL LANDS (Km)	-	-	-	1.0	2.3	0.6	0.8	0.5	-	-	0.6	1.3	0.2	-	-
DORMANT AGRICULTURAL LANDS (Km)	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-
SOILS CRITICAL FOR DEVELOPMENT (Km)	-	-	-	-	4.8	4.0	2.5	1.8	-	0.2	0.6	3.8	1.0	-	-
SOILS SUPPLEMENTARY FOR DEVELOPMENT (Km)	-	-	-	18.3	8.0	15.2	12.2	3.8	5.1	6.3	7.5	5.6	0.6	-	-
FORESTRY RESOURCES															
REGENERATION AREAS (Ha)	-	-	4.2	-	-	3.2	-	-	-	-	-	-	-	-	-
AREAS TO BE HARVESTED BY 2001 (Ha)	-	-	4.8	2.0	-	6.0	5.6	-	3.6	-	-	-	-	-	-
HIGH CAPABILITY FOR FOREST PRODUCTION (Ha)	-	-	-	23.4	-	9.0	17.6	-	-	-	-	-	-	9.2	-
JACKPINE (LESS THAN 70 YEARS OLD) (Ha)	-	-	-	3.4	2.0	2.4	-	-	-	-	-	-	-	-	-
SPRUCE & FIR (LESS THAN 80 YEARS) (Ha)	18.0	21.6	-	17.4	8.6	11.3	10.8	-	10.0	-	2.4	3.0	-	-	-
POPLAR & BIRCH (LESS THAN 50 YEARS) (Ha)	-	3.2	-	4.7	7.2	3.8	-	4.0	0.4	-	-	6.4	0.6	-	-
JACKPINE (70 YEARS AND OLDER) (Ha)	-	-	-	0.2	5.8	-	-	-	-	-	-	-	-	-	-
SPRUCE & FIR (80 YEARS AND OLDER) (Ha)	27.2	3.2	-	7.9	6.4	1.5	5.6	-	-	1.6	2.4	-	-	-	-
POPLAR & BIRCH (50 YEARS AND OLDER) (Ha)	4.8	15.6	1.6	10.5	4.8	16.1	13.4	9.6	0.5	1.0	4.2	17.0	2.6	10.8	1.2
MIXED FOREST (ALL AGES) (Ha)	15.2	13.2	-	4.0	-	11.5	2.0	-	1.7	-	1.4	-	-	-	-
BIOLOGICAL RESOURCES															
COLD WATER SPORT FISH HABITAT (#)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOOSE AQUATIC FEEDING AREAS (#)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
WATERFOWL PRODUCTION & STAGING AREAS (Km)	-	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-
MOOSE WINTERING AREAS (Ha)	5.6	10.6	-	-	-	3.2	7.6	-	5.2	-	-	-	-	-	-
WARM WATER FISH HABITAT (#)	-	-	-	1	1	1	-	1	-	-	-	-	-	2	-
RECREATION															
PROVINCIAL PARKS (#)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VIEWSHED OF CANOE ROUTES (#)	-	2	2	1	1	1	1	-	1	-	-	-	-	1	-
VIEWSHED OF REMOTE ROADS (#)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
CANDIDATE NATURE RESERVES (#)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SKI AREAS (#)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
HERITAGE RESOURCES															
KNOWN ARCHAEOLOGICAL SITES (#)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KNOWN HISTORIC SITES & TRAILS (#)	-	-	-	-	-	2	1	-	-	-	-	-	-	-	1
AREAS OF HIGH ARCHAEOLOGICAL POTENTIAL (Km)	1.7	2.0	3.0	11.5	10.0	15.0	-	-	-	-	-	-	0.7	3.1	0.6
MINERAL RESOURCES															
ACTIVE MINE AREAS (#)								-	-	-	-	-	-	-	-
DORMANT MINE AREAS (#)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PROPOSED MINE AREAS (#)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
AREAS OF HIGH MINERAL POTENTIAL (Km)	22.3	15.3	3.0	27.9	19.4	10.9	13.0	5.6	3.0	6.5	8.1	9.4	2.0	3.1	0.6
ACTIVE & DORMANT PITS (#)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
AGGREGATE RESERVES IDENTIFIED BY MNR (Km)	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-
CRITICAL AGGREGATE RESERVES (Km)	-	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-
SIGNIFICANT AGGREGATE RESERVES (Km)	-	-	-	2.0	1.8	-	-	-	-	-	-	-	-	-	-
UNIQUE GEOLOGICAL FEATURES (Km)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COST/TECHNICAL															
LENGTH (Km)	22.3	18.9	3.0	27.9	19.4	23.8	14.7	5.6	5.1	6.5	8.1	9.4	2.0	3.1	2.4
TOTAL COST ($,000,000)	5.59	4.61	0.69	7.14	4.58	6.39	3.59	1.42	1.20	1.64	2.06	2.57	0.53	0.88	0.67
CONFLICT WITH MINING ACTIVITY (#)	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
TRANSMISSION LINE X-OVERS (#)	-	-	-	1	-	1	-	-	-	-	-	-	2	2	-
LONG RIVER X-INGS (#)	-	-	-	1	1	1	-	1	-	-	-	-	-	2	1
PARALLEL OF PIPELINE (Km)	0.8	-	-	-	-	0.8	-	-	1.3	-	-	-	-	-	-
PIPELINE X-OVER (#)	-	-	-	1	1	1	1	-	2	1	1	-	-	-	-
AIR NAVIGATION FACILITIES (SEPAR. Km)	-	-	-	-	-	-	-	1.3	-	-	-	3.0	-	-	-
COMMUNICATIONS FACILITIES (SEPAR. Km)	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-
ROAD/RAILWAY X-INGS (#)	1	1	1	4	4	5	3	2	-	1	1	4	1	-	-

Table 10.1

Step 2 - Alternative Sub-Route Comparison and Selection - this involved comparing longer lengths of route or combinations of route links called sub-routes which also had common end points and selecting the preferred sub-route within each comparison.

Step 3 - Alternative Route Comparison and Selection - after having selected the preferred links and sub-routes in Steps 1 and 2, two alternative routes remained which were compared and a preferred route was selected.

10.1 Alternative Link Comparison and Selection

Within the entire route link network there were three pairs of links having common end points; namely AB and DB; JC and JK; and GH and GHe. Based on the evaluation results for each link coupled with knowledge of the areas which could be potentially affected by each of these links, the paired links were compared and a preferred link within each pair was selected. The following provides the results of this comparison and selection process.

10.1.1 Link AB Vs DB

Links AB and DB tap the existing 230 kV line between Porcupine TS and the Kidd Creek Met Site at points A and D respectively. These links follow a northerly alignment and meet at point B which is located in the Ice Chest Lake area of Evelyn Township. The evaluation results for these two links are in Table 10.2.

After having identified the DB link and subsequently meeting with technical staff at Kidd Creek, two major potential problems were identified. They are as follows:

(a) Kidd Creek had just completed a new plant to process gold ore near the Ontario Northland Railway and immediately north of point D; and

(b) The large tailings area immediately east of this route will require further expansion to the west resulting in the dyke face extending across this portion of the route link.

Both of these developments would require a westward realignment of this link with possible multiple crossings of the Porcupine River.

Based on the above information combined with the evaluation results shown in Table 10.2, link AB was preferred over DB for the following advantages:

- avoids recent developments on Kidd Creek property.

- avoids possible multiple crossings of the Porcupine River with cutting of trees along river banks.

EVALUATION TABLE	LINK PAIRS					
DATA TYPE	AB	DB	JC	JK	GH	GHe
HUMAN SETTLEMENT						
HOME REMOVALS (#)	0	0	0	0	0	0
HOMES WITHIN 75m (#)	0	0	0	0	0	1
COMMERCIAL/INDUSTRIAL (#)	0	1	0	0	0	0
PROPERTIES AFFECTED (#)	25	14	2	2	6	12
DIAGONAL TO BOUNDARY (Km)	19.4	15.4	1.5	0.6	6.5	4.9
PARALLEL TO BOUNDARY (Km)	2.9	3.5	1.6	0.0	0.0	0.0
ON OR ADJACENT TO BOUNDARY (Km)	0.0	0.0	0.0	0.0	0.0	3.2
PARALLEL EXISTING R/W (Km)	0.0	0.0	0.0	0.0	0.0	4.9
DESIGNATED RESIDENTIAL/INSTITUTIONAL (Km)	0.0	0.0	0.0	0.0	0.0	0.0
DESIGNATED INDUST/COMMERCIAL (Km)	0.0	0.0	0.0	0.0	0.0	0.0
DESIGNATED COTTAGE AREA (Km)	1.0	0.8	0.0	0.0	0.0	0.0
DESIGNATED HAZARD LAND (Km)	0.0	0.0	0.0	0.0	3.0	0.0
AGRICULTURAL RESOURCES						
ACTIVE AGRICULTURAL LANDS (Km)	0.0	0.0	0.0	0.0	0.0	0.6
DORMANT AGRICULTURAL LANDS (Km)	0.0	0.0	0.0	0.0	0.0	0.0
SOILS CRITICAL FOR DEVELOPMENT (Km)	0.0	0.0	0.0	0.0	0.2	0.6
SOILS SUPPLEMENTARY FOR DEVELOPMENT (Km)	0.0	0.0	0.0	0.0	6.3	7.5
FORESTRY RESOURCES						
REGENERATION AREAS(Ha)	0.0	0.0	0.0	0.0	0.0	0.0
AREAS TO BE HARVESTED BY 2001 (Ha)	0.0	0.0	0.0	0.0	0.0	0.0
HIGH CAPABILITY FOR FOREST PRODUCTION(Ha)	0.0	0.0	9.2	0.0	0.0	0.0
JACKPINE(LESS THAN 70 YEARS OLD)(Ha)	0.0	0.0	0.0	0.0	0.0	0.0
SPRUCE & FIR(LESS THAN 80 YEARS)(Ha)	18.0	21.6	0.0	0.0	0.0	2.4
POPLAR & BIRCH(LESS THAN 50 YEARS)(Ha)	0.0	3.2	0.0	0.0	0.0	0.0
JACKPINE(70 YEARS AND OLDER)(Ha)	0.0	0.0	0.0	0.0	0.0	0.0
SPRUCE & FIR(80 YEARS AND OLDER)(Ha)	27.2	3.2	0.0	0.0	1.6	2.4
POPLAR & BIRCH(50 YEARS AND OLDER)(Ha)	4.8	15.6	10.8	1.2	1.0	4.2
MIXED FOREST(ALL AGES)(Ha)	15.2	13.2	0.0	0.0	0.0	1.4
BIOLOGICAL RESOURCES						
COLD WATER SPORT FISH HABITAT (#)	0	0	0	0	0	0
MOOSE AQUATIC FEEDING AREAS (#)	0	0	0	0	0	0
WATERFOWL PRODUCTION & STAGING AREAS (Km)	0.0	0.0	0.0	0.0	0.0	0.0
MOOSE WINTERING AREAS (Ha)	5.6	10.8	0.0	0.0	0.0	0.0
WARM WATER FISH HABITAT (#)	0	0	2	0	0	0
RECREATION						
PROVINCIAL PARKS (#)	0	0	0	0	0	0
VIEWSHED OF CANOE ROUTES (#)	0	2	1	0	0	0
VIEWSHED OF REMOTE ROADS (#)	0	0	0	0	0	0
CANDIDATE NATURE RESERVES (#)	0	0	0	0	0	0
SAI AREAS (#)	0	0	0	0	0	0
HERITAGE RESOURCES						
KNOWN ARCHAEOLOGICAL SITES (#)	0	0	0	0	0	0
KNOWN HISTORIC SITES & TRAILS (#)	0	0	0	1	0	0
AREAS OF HIGH ARCHAEOLOGICAL POTENTIAL(Km)	1.7	2.0	3.1	0.6	0.0	0.0
MINERAL RESOURCES						
ACTIVE MINE AREAS (#)	0	0	0	0	0	0
DORMANT MINE AREAS (#)	0	0	0	0	0	0
PROPOSED MINE AREAS(#)	0	0	0	0	0	0
AREAS OF HIGH MINERAL POTENTIAL (Km)	22.3	15.3	3.1	0.6	6.5	8.1
ACTIVE & DORMANT PITS (#)	0	0	0	0	0	0
AGGREGATE RESERVES IDENTIFIED BY MNR(Km)	0.0	0.0	0.0	0.0	0.0	0.0
CRITICAL AGGREGATE RESERVES (Km)	0.0	0.0	0.0	0.0	0.0	0.0
SIGNIFICANT AGGREGATE RESERVES (Km)	0.0	0.0	0.0	0.0	0.0	0.0
UNIQUE GEOLOGICAL FEATURES (Km)	0.0	0.0	0.0	0.0	0.0	0.0
COST/TECHNICAL						
LENGTH (km)	22.3	18.9	3.1	2.4	6.5	8.1
TOTAL COST ($,000,000)	5.59	4.61	0.68	0.87	1.64	2.06
CONFLICT WITH MINING ACTIVITY(#)	0	0	0	0	0	0
TRANSMISSION LINE X-OVERS(#)	0	0	2	0	0	0
LONG RIVER X-INGS(#)	0	0	2	1	0	0
PARALLEL OF PIPELINE(Km)	0.8	0.0	0.0	0.0	0.0	0.0
PIPELINE X-OVER(#)	0	0	0	0	1	1
AIR NAVIGATION FACILITIES(SEPAR.Km)	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNICATIONS FACILITIES(SEPAR.Km)	0.0	0.0	0.0	0.0	0.0	0.0
ROAD/RAILWAY X-INGS(#)	1	1	0	0	1	1

Table 10.2

- affects less moose wintering area (5.6 vs 10.8 Ha).
- avoids viewsheds of canoe route on the Porcupine River.
- parallels an existing gas pipeline for 0.8 km.
- has better access for construction and maintenance at the southern end.
- requires less cutting of immature timber (18.0 vs 21.6 Ha).
- avoids potential decrease in enjoyment of recreational areas.

The advantages for AB outweighed the following disadvantages:

- is higher in cost ($5.6 million vs $4.6 million).
- is a longer route (22.3 km vs 18.9 km).
- crosses more area of high mineral potential (22.3 vs 15.3 km).
- requires more overall cutting of forest (65.2 vs 56.8 Ha).

10.1.2 Link JC Vs JK

These two links originate at point J which is situated a short distance south of the Abitibi-Price mill site in Iroquois Falls. The JK link runs northwest crossing Meadow Creek to point K which is located at the southern end of the Abitibi-Price mill property. From point K the line would turn north and then northeast on Abitibi-Price property to the proposed new Abitibi-Price transformer station near the main entrance to the mill. North of point K, the new line would cross two existing 115 kV lines and then follow a watercourse which runs along the edge of a golf course before reaching the transformer station site.

Link JC would run east crossing the Abitibi River before turning north to a point due east of the mill. At this point the line would turn west crossing the Abitibi River again to point C, the existing Abitibi-Price transformer station. Table 10.2 provides the evaluation results of these two route links.

Link JC was preferred over JK for the following advantages:

- avoids crossing of the Abitibi/DeTroyes Provincial Park (i.e., waterway park), near the official access point;
- avoids placement of towers along and over the watercourse between the plant and the golf course;

- avoids additional visual impact on homes to the west of the Abitibi-Price plant;

- avoids high steel towers required to cross over the existing 115 kV lines on Abitibi-Price property;

- avoids potential decrease in enjoyment of recreational areas in and surrounding the built-up community; and

- is more compatible with the community by locating the line east of the plant.

These advantages for JC outweighed the following disadvantages:

- affects more area of high capability forest land (9.2 vs 0.0 Ha);

- requires more overall cutting of forest (10.8 vs 1.2 Ha);

- has one additional river crossing;

- affects more area with high archaeological potential (3.1 vs 0.6 km);

- affects more area with high mineral potential (3.1 vs 0.6 km);

- is a longer route (3.1 vs 2.4 km).

10.1.3 Link GH Vs GHe

Links GH and GHe are located west of the community of Monteith. Link GH originates from a parallel of the existing 115 kV line at point G and turns in a northeasterly direction to point H which is located immediately east of the Highway 11 crossing. The link crosses through an undeveloped area before crossing Highway 11. Link GHe parallels the existing 115 kV line for 4.9 km before turning north to point H. This new right-of-way portion passes through a small area of agricultural land and is close to homes south of Highway 11. Table 10.2 provides the evaluation results of these two route links. Since both of these links have common end points, the "e" was added to the GHe link to denote a partial parallel of the existing 115 kV line.

Based on the evaluation results and a comparison of these two links, link GH was preferred for the following advantages:

- is lower in cost ($1.6 vs $2.0 million);

- is shorter in length (6.5 vs 8.1 km);

- affects less area of mineral potential (6.5 vs 8.1 km);

- has no affect on active agricultural land compared to crossing 0.6 km on link GHe;

- has no homes in proximity to the route compared to one home in proximity to link GHe; and

- requires less overall cutting of forest (2.6 vs 10.4 Ha).

The advantages for link GH outweighed the following disadvantages:

- crosses more designated hazard land; and

- does not utilize the existing 115 kV right-of-way.

10.2 Alternative Sub-Route Comparison and Selection

The next level of comparison and selection focussed on the sub-route alternatives. Two pairs of sub-routes having common end points were identified; namely, the pair FMI and FGHI and the pair LC and LMIJC. Based on the evaluation results of each of these sub-route alternatives, a preferred sub-route was selected from each pair. The following provides the results of this comparison and selection process.

10.2.1 Sub-Route FMI and FGHI

Sub-routes FMI and FGHI begin at point F just east of Kettle Lakes Provincial Park and end a short distance south of Iroquois Falls at point I. Sub-route FMI does not utilize any of the existing 115 kV right-of-way whereas FGHI parallels the existing right-of-way along the FG portion of its length. Neither route crosses areas of human settlement south of Highway 11.

North of Highway 11 near Porquois Junction sub-route FMI crosses through a mixture of active and abandoned agriculture, forest cover and comes in the vicinity of a number of rural residences. It also requires a crossing of Meadow Creek immediately west of point I.

Sub-route FGHI crosses Highway 11 northwest of Monteith and continues in a northeasterly direction to the first lot line west of Highway 577. At this point, the sub-route runs due north along the lot line until it reaches point I. There is less development in the vicinity of this subroute compared to sub-route FMI.

After having compared these two sub-routes from environmental, technical, cost and socio-economic perspectives, sub-route FGHI was preferred. Table 10.3 provides the evaluation results for both sub-route alternatives and the following lists the advantages of sub-route FGHI:

- has no diagonal crossing of active agricultural land;

EVALUATION TABLE

DATA TYPE	SUB-ROUTES FHI	FGHI	LC	LMIJC
HUMAN SETTLEMENT				
HOME REMOVALS (#)	0	0	0	0
HOMES WITHIN 75m (#)	0	0	0	0
COMMERCIAL/INDUSTRIAL (#)	0	0	0	0
PROPERTIES AFFECTED (#)	26	39	36	27
DIAGONAL TO BOUNDARY (Km)	15.1	13.2	15.9	6.5
PARALLEL TO BOUNDARY (Km)	2.6	0.0	6.1	15.2
ON OR ADJACENT TO BOUNDARY (Km)	2.6	7.8	6.8	8.4
PARALLEL EXISTING R/W (Km)	0.0	5.1	4.9	0.0
DESIGNATED RESIDENTIAL/INSTITUTIONAL (Km)	0.0	0.0	0.0	0.0
DESIGNATED INDUST/COMMERCIAL (Km)	0.0	0.0	0.0	0.0
DESIGNATED COTTAGE AREA (Km)	0.0	0.0	0.0	0.0
DESIGNATED HAZARD LAND (Km)	5.2	7.2	8.1	5.2
AGRICULTURAL RESOURCES				
ACTIVE AGRICULTURAL LANDS (Km)	1.3	1.3	1.0	3.0
DORMANT AGRICULTURAL LANDS (Km)	0.0	0.0	0.0	0.0
SOILS CRITICAL FOR DEVELOPMENT (Km)	4.3	4.0	0.0	7.6
SOILS SUPPLEMENTARY FOR DEVELOPMENT (Km)	16.0	17.0	18.3	12.4
FORESTRY RESOURCES				0
REGENERATION AREAS(Ha)	0.0	0.0	0.0	0.0
AREAS TO BE HARVESTED BY 2001 (Ha)	3.6	3.6	2.0	0.0
HIGH CAPABILITY FOR FOREST PRODUCTION(Ha)	17.6	0.0	23.4	9.2
JACKPINE(LESS THAN 70 YEARS OLD)(Ha)	0.0	0.0	3.4	2.0
SPRUCE & FIR(LESS THAN 80 YEARS)(Ha)	10.8	13.0	17.4	8.6
POPLAR & BIRCH(LESS THAN 50 YEARS)(Ha)	4.0	4.8	4.7	11.8
JACKPINE(70 YEARS AND OLDER)(Ha)	0.0	0.0	0.2	5.8
SPRUCE & FIR(80 YEARS AND OLDER)(Ha)	5.6	1.6	7.9	6.4
POPLAR & BIRCH(50 YEARS AND OLDER)(Ha)	23.0	16.5	10.5	27.8
MIXED FOREST(ALL AGES)(Ha)	2.0	1.7	4.0	0.0
BIOLOGICAL RESOURCES				
COLD WATER SPORT FISH HABITAT (#)	0	0	0	0
MOOSE AQUATIC FEEDING AREAS (#)	0	0	0	0
WATERFOWL PRODUCTION & STAGING AREAS (Km)	0.0	0.0	0.0	0.0
MOOSE WINTERING AREAS (Ha)	7.6	5.2	0.0	0.0
WARM WATER FISH HABITAT (#)	1	0	1	4
RECREATION				
PROVINCIAL PARKS (#)	0	0	0	0
VIEWSHED OF CANOE ROUTES (#)	1	1	1	2
VIEWSHED OF REMOTE ROADS (#)	0	0	0	0
CANDIDATE NATURE RESERVES (#)	0	0	0	0
SKI AREAS (#)	0	0	1	0
HERITAGE RESOURCES				
KNOWN ARCHAEOLOGICAL SITES (#)	0	0	0	0
KNOWN HISTORIC SITES & TRAILS (#)	1	0	0	0
AREAS OF HIGH ARCHAEOLOGICAL POTENTIAL (Km)	0.0	0.0	11.5	13.8
MINERAL RESOURCES				
ACTIVE MINE AREAS (#)	0	0	0	0
DORMANT MINE AREAS (#)	0	0	0	0
PROPOSED MINE AREAS(#)	0	0	0	0
AREAS OF HIGH MINERAL POTENTIAL (Km)	18.6	18.9	27.9	30.1
ACTIVE & DORMANT PITS (#)	0	0	0	0
AGGREGATE RESERVES IDENTIFIED BY MNR(Km)	0.0	0.0	0.0	0.0
CRITICAL AGGREGATE RESERVES (Km)	0.0	0.0	0.0	0.0
SIGNIFICANT AGGREGATE RESERVES (Km)	0.0	0.0	2.0	1.8
UNIQUE GEOLOGICAL FEATURES (Km)	0.0	0.0	0.0	0.0
COST/TECHNICAL				
LENGTH (Km)	20.3	21.0	27.9	30.1
TOTAL COST ($,000,000)	5.91	5.41	7.14	7.41
CONFLICT WITH MINING ACTIVITY(#)	1	0	0	0
TRANSMISSION LINE X-OVERS(#)	0	0	1	4
LONG RIVER X-INGS(#)	1	0	1	4
PARALLEL OF PIPELINE(Km)	0.0	1.3	0.0	0.0
PIPELINE X-OVER(#)	1	3	1	1
AIR NAVIGATION FACILITIES(SEPAR.Km)	1.3	3.0	0.0	1.3
COMMUNICATIONS FACILITIES(SEPAR.Km)	0.0	0.0	0.4	0.0
ROAD/RAILWAY X-INGS(#)	5	5	4	7

Table 10.3

- affects less moose wintering areas (5.2 vs 7.6 Ha);
- does not cross any high capability forest production land as compared to 17.6 Ha crossed along sub-route FMI;
- has very little potential interference with future rural residential development as compared to the MI portion of sub-route FMI;
- is much further away from the Iroquois Falls airport outer marker;
- parallels 5.1 km of the existing 115 kV line along the FG link;
- requires less cutting of immature timber (14.8 vs 17.8 Ha);
- requires less overall cutting of forest (39.6 vs 45.4 Ha).

The advantages given for sub-route FGHI outweighed the following disadvantages:

- is higher in cost ($5.4 vs 4.9 million);
- is a longer route (21.0 vs 20.3 km).

10.2.2 Sub-route LC Vs LMIJC

These two sub-routes originate at point L north of Ice Chest Lake and run east to cross the Frederick House River and then Highway 11 to eventually terminate at point C (the existing Abitibi-Price transformer station). The areas crossed by both sub-routes west of Highway 11 are virtually uninhabited except in the Nellie Lake area for sub-route LC and the rural residents along the Cemetery Road west of Porquois Junction for sub-route LMIJC.

Sub-route LMIJC parallels the survey fabric from point L to M where it crosses through a mixture of agricultural and forest land towards and around the east side of Iroquois Falls to end at point C.

These two sub-routes were evaluated from environmental, technical, cost and socio-economic considerations and the results are in Table 10.3. Based on the evaluation results, sub-route LC was preferred over LMIJC for the following advantages:

- is a shorter route (27.9 vs 30.1 km);
- is less costly ($6.47 vs $6.89 million);
- affects less area of high archaeological potential (11.5 vs 13.8 km);

- crosses less warm water fish habitat (1 vs 4);
- is further away from the Iroquois Falls airport outer marker (7.5 vs 1.3 km);
- affects less active agricultural land (1.0 vs 3.0 km) with less diagonal crossing;
- has no effect on soils critical for agricultural development as compared to 7.6 km crossed by sub-route LMIJC;
- has much less potential for interference with future rural residential development; and
- requires less overall cutting of forest (48.1 vs 62.4 Ha).

These advantages outweighed the following disadvantages of sub-route LC:

- crosses more designated hazard lands (8.1 vs 5.2 km);
- affects more future harvest area for timber (2.0 vs 0.0 Ha);
- affects more high capability land for forest production (23.4 vs 9.2 Ha);
- is close to existing microwave communications facilities southeast of Nellie Lake; and
- requires more cutting of immature timber (25.5 vs 22.4 Ha).

10.3 Alternative Route Comparison and Selection

With the preferred links and sub-routes selected, two alternative routes remained: the northern route ABLC and the southern route EFGHIJC.

Alternative route ABLC has been described earlier for the AB and LC links. The remaining link LC is a short section north of Ice Chest Lake and it passes through an area of forest regeneration managed by the Ministry of Natural Resources in Timmins.

The section of alternative route EFGHIJC not described earlier is link EF. It represents the longest link within this route alternative and for a major portion of its length, it parallels the north side of the existing 115 kV transmission line.

It originates at point E (i.e., tap point along the 230 kV line between Porcupine TS and the Kidd Creek Met site) and travels south to the township boundary. It follows the township boundary east, crossing Highway 101 and then turns southeast to meet and parallel the existing 115 kV line to point F. Along this parallel alignment the route crosses the Porcupine River, Matheson Creek, Highway 101 and the Frederick House River.

East of the Frederick House River crossing, the route crosses a small area of active agriculture, passes north of cottages on Charland Lake, crosses Highway 67 and then crosses through an area of forest regeneration immediately north of Kettle Lake Provincial Park.

Both of these alternative routes were evaluated on the same basis as the links and sub-routes and the results of this evaluation are shown in Table 10.4. After conducting a comparison of the two alternative routes based on the evaluation results, the southern route EFGHIJC was preferred over the northern route ABLC for the following advantages:

- follows existing transmission line right-of-way for 44% of the route (22.2 vs 4.9 km);
- is a shorter route (49.9 vs 53.2 km);
- is slightly lower in cost ($13.2 vs $13.4 million);
- affects less area of high mineral potential (34.9 vs 53.2 km);
- avoids affecting the Iroquois Falls ski area;
- does not cross viewsheds of remote roads;
- has less effect on high capability land for forest production (18.2 vs 23.4 Ha);
- has less effect on designated cottage areas (1.8 vs 3.2 km);
- avoids being in proximity to the microwave radio facilities southeast of Nellie Lake; and
- requires less overall cutting of timber (100.2 vs 114.9 Ha).

These advantages outweighed the following disadvantages:

- affects more active agricultural land (2.1 vs 1.0 km);
- affects soils critical for agricultural development (9.0 vs 0.0 km);
- affects more forest area to be harvested by the year 2001 (9.6 vs 6.8 Ha);
- requires more cutting of immature timber (43.5 vs 35.9 Ha);
- affects a waterfowl production area;

EVALUATION TABLE DATA TYPE	ALTERNATIVE ROUTES ABLC	 EFGH IJC
HUMAN SETTLEMENT		
HOME REMOVALS (#)	0	0
HOMES WITHIN 75m (#)	0	0
COMMERCIAL/INDUSTRIAL (#)	0	0
PROPERTIES AFFECTED (#)	62	89
DIAGONAL TO BOUNDARY (Km)	37.4	36.9
PARALLEL TO BOUNDARY (Km)	9.0	2.1
ON OR ADJACENT TO BOUNDARY (Km)	6.8	10.9
PARALLEL EXISTING R/W (Km)	4.9	22.2
DESIGNATED RESIDENTIAL/INSTITUTIONAL (Km)	0.0	0.0
DESIGNATED INDUST/COMMERCIAL (Km)	0.0	0.7
DESIGNATED COTTAGE AREA (Km)	3.2	1.8
DESIGNATED HAZARD LAND (Km)	8.1	7.2
AGRICULTURAL RESOURCES		
ACTIVE AGRICULTURAL LANDS (Km)	1.0	2.1
DORMANT AGRICULTURAL LANDS (Km)	0.3	0.0
SOILS CRITICAL FOR DEVELOPMENT (Km)	0.0	9.0
SOILS SUPPLEMENTARY FOR DEVELOPMENT (Km)	18.3	33.8
FORESTRY RESOURCES		
REGENERATION AREAS (Ha)	4.2	3.2
AREAS TO BE HARVESTED BY 2001 (Ha)	6.8	9.6
HIGH CAPABILITY FOR FOREST PRODUCTION (Ha)	23.4	18.2
JACKPINE (LESS THAN 70 YEARS OLD) (Ha)	3.4	2.4
SPRUCE & FIR (LESS THAN 80 YEARS) (Ha)	35.4	24.3
POPLAR & BIRCH (LESS THAN 50 YEARS) (Ha)	4.7	9.2
JACKPINE (70 YEARS AND OLDER) (Ha)	0.2	0.0
SPRUCE & FIR (80 YEARS AND OLDER) (Ha)	35.1	3.1
POPLAR & BIRCH (50 YEARS AND OLDER) (Ha)	16.9	48.0
MIXED FOREST (ALL AGES) (Ha)	19.2	13.2
BIOLOGICAL RESOURCES		
COLD WATER SPORT FISH HABITAT (#)	0	0
MOOSE AQUATIC FEEDING AREAS (#)	0	1
WATERFOWL PRODUCTION & STAGING AREAS (Km)	0.0	0.2
MOOSE WINTERING AREAS (Ha)	5.6	8.4
WARM WATER FISH HABITAT (#)	1	3
RECREATION		
PROVINCIAL PARKS (#)	0	0
VIEWSHED OF CANOE ROUTES (#)	3	3
VIEWSHED OF REMOTE ROADS (#)	1	0
CANDIDATE NATURE RESERVES (#)	0	0
SAI AREAS (#)	1	0
HERITAGE RESOURCES		
KNOWN ARCHAEOLOGICAL SITES (#)	0	0
KNOWN HISTORIC SITES & TRAILS (#)	0	2
AREAS OF HIGH ARCHAEOLOGICAL POTENTIAL (Km)	16.2	18.8
MINERAL RESOURCES		
ACTIVE MINE AREAS (#)	0	0
DORMANT MINE AREAS (#)	0	0
PROPOSED MINE AREAS (#)	0	1
AREAS OF HIGH MINERAL POTENTIAL (Km)	53.2	34.9
ACTIVE & DORMANT PITS (#)	0	1
AGGREGATE RESERVES IDENTIFIED BY MNR (Km)	0.0	1.0
CRITICAL AGGREGATE RESERVES (Km)	1.8	0.0
SIGNIFICANT AGGREGATE RESERVES (Km)	2.0	0.0
UNIQUE GEOLOGICAL FEATURES (Km)	0.0	0.0
COST/TECHNICAL		
LENGTH (Km)	53.2	49.9
TOTAL COST ($,000,000)	13.4	13.2
CONFLICT WITH MINING ACTIVITY (#)	0	1
TRANSMISSION LINE X-OVERS (#)	1	5
LONG RIVER X-INGS (#)	1	3
PARALLEL OF PIPELINE (Km)	0.8	2.1
PIPELINE X-OVER (#)	1	4
AIR NAVIGATION FACILITIES (SEPAR. Km)	0.0	3.0
COMMUNICATIONS FACILITIES (SEPAR. Km)	0.4	0.0
ROAD/Railway X-INGS (#)	6	11

Table 10.4

- affects more moose wintering area (8.4 vs 5.6 Ha);
- has more long river crossings (5 vs 1);
- passes close to the historic Hills Landing site on the Porcupine River and crosses the Porcupine Trail;
- crosses a potential mining area; and
- crosses an aggregate reserve.

Each of the above disadvantages of the selected route would result in minor effects from right-of-way clearing or transmission line construction, operation and maintenance. In each case, these effects are considered minor in nature and no specific mitigative measures are required beyond those identified in the "Environmental Guidelines for Construction and Maintenance of Transmission Facilities", March 1981, Revision 1, March 1986.

The preferred route will create minimal socio-economic impacts. By following the existing right-of-way for 50 percent of its length, it significantly reduces the amount of new access that would have been created with the other alternative. This has the result of maintaining to a greater degree, the character of the area and minimizes loss in enjoyment and economic benefit of natural resources. With the location of the transmission line adjacent to and not through the community of Iroquois Falls, there will be minimal if any loss in enjoyment of recreational and community facilities. Also, to a community which is development-oriented and dependent on manufacturing, the transmission line is more likely to be accepted as necessary to the economic viability of the town.

10.4 Summary of Potential Effects and Mitigation

Environmental changes or effects would result from the construction of the 230 kV transmission line along the recommended route. Ontario Hydro would endeavour to minimize the extent and duration of these effects through the application of appropriate mitigation and restoration measures. These measures would be applied in accordance with Ontario Hydro "Environmental Guidelines for Construction and Maintenance of Transmission Facilities", March 1981, Revision 1, March 1986. These include a broad range of mitigation, restoration and/or compensation measures which would be applied as necessary and appropriate.

Specific areas along the recommended route for which mititgation measures are being considered include the following situations:

- active agricultural land;

The route is located along the lot line in Clergue and Calvert Townships to reduce affects on existing agricultural operations. Parallel to the existing line, poles will be lined up with existing poles and guys will be placed on fence lines.

. waterfowl production area on the Fredrick House River;

Construction will be scheduled to avoid breeding and brooding time in this area.

. river crossings;

A vegetation buffer will be maintained along the banks to avoid siltation.

. removal of merchantable timber;

Merchantable timber will be utilized and the owner compensated.

. areas of high archaeological potential;

Archaeological surveys and reports will be produced for those areas where high potential has been identified.

. areas with high mineral potential;

The local Mining Recorders Office will be advised of the route location. This will ensure early notification of Ontario Hydro proposal to any future development.

. area of aggregate reserve along existing line east of Highway 67.

The new poles will be lined up with existing poles to minimize the area removed from production.

10.5 Concurrence of Provincial Government Ministries and Municipal Councils

Provincial government ministries and other government agencies listed in Appendix B4 were advised of the preferred route location and also received a copy of a draft EA. All those that responded were in agreement with the route location. All comments provided on the draft EA were considered and the draft EA was amended to reflect concerns raised.

The affected municipalities, City of Timmins, Town of Iroquois Falls and the Corporation of Black River - Matheson, have advised that the route location is acceptable within their municipalities.

11.0 RECOMMENDATION

11.1 Recommended Route

It is recommended that approval be granted for alternative route EFGHIJC as shown on Figures 11.1(a), 11.1(b) and 11.1(c). This route would be used for a single circuit 230 kV wood pole line from a tap on the Kidd Creek Met Site supply line to Iroquois Falls.

The route would start at a junction in the 230 kV supply line to Kidd Creek Met Site and would proceed southeast until it reaches the existing 115 kV (25 Hz) line. It would parallel this existing line on the north side crossing the Frederick House River, pass north of the Kettle Lakes Provincial Park towards Monteith. The route would leave the parallel of this line west of Monteith at point G.

After leaving the existing 115 kV line at point G, the route would cross diagonally through an undeveloped part of Clergue Twp. The route would then cross Hwy 11 at nearly right angles in a wooded area. At the lot line between lots 1 and 2 in Con. III (near point H), the route would turn north to follow the lot boundary to a point in Con. II of Calvert Twp (point I). This portion of the route would cross mostly undeveloped land with some agricultural activity. Since the route would be on the lot line, very little, if any, disruption to agricultural activities is anticipated.

From point I in Con. II, Calvert Twp, the route would head in a northeasterly direction crossing two existing 115 kV lines, Hwy 577 and the Abitibi River. The Abitibi River crossing is at a point where the river has been designated a waterway park by MNR (Abitibi/DeTroyes Provincial Park). A second crossing of the Abitibi River would be made at the Abitibi-Price plant to the north of the waterway park. MNR has not expressed any concerns regarding the waterway park crossing.

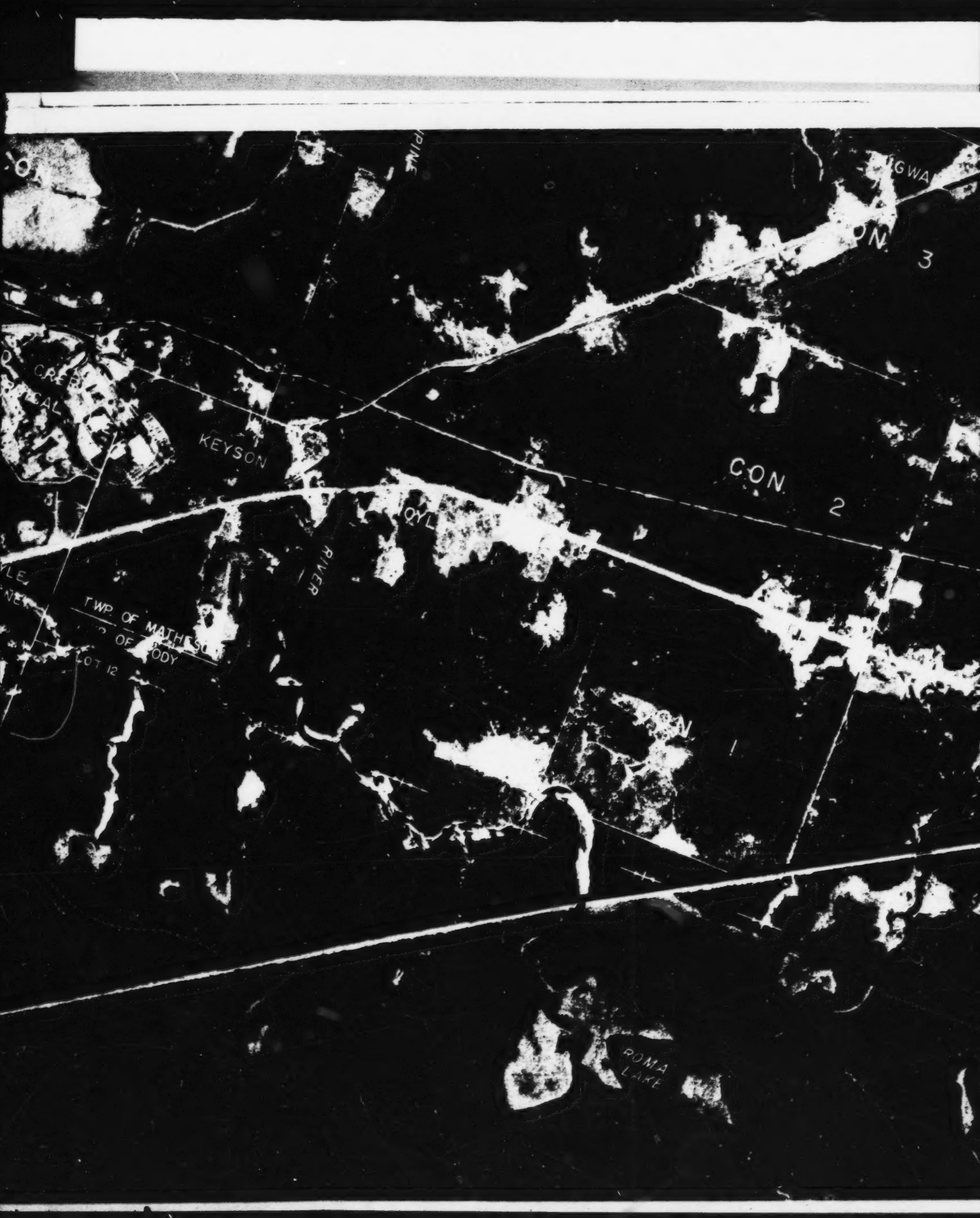
The line would terminate at point C (the existing 115 kV customer owned transformer station).

11.2 Recommended Structure

The recommended structure for this undertaking is a 230 kV single circuit wood pole structure called the Gulf Port structure as shown on Figure 11.2. This two pole structure is used only for suspension or slight angles. Large angles (or turns) in the line will require a three pole structure with anchors and guy wires.

PORCUPINE
GAS PIPELINE
ONTARIO
NORTHLAND
REID JCT FA 56
THREE NATIONS LAKE
CON
TOWNSHIP OF WHITNEY
THE CITY OF TIMMINS
CON 4

CON
KID CREEK
KEYSON
TWP OF DOYLE
WHITNEY
TWP OF MATHESON
TWP OF BODY
LOT 12
CON 6
RIVER
DOYL
CON
5

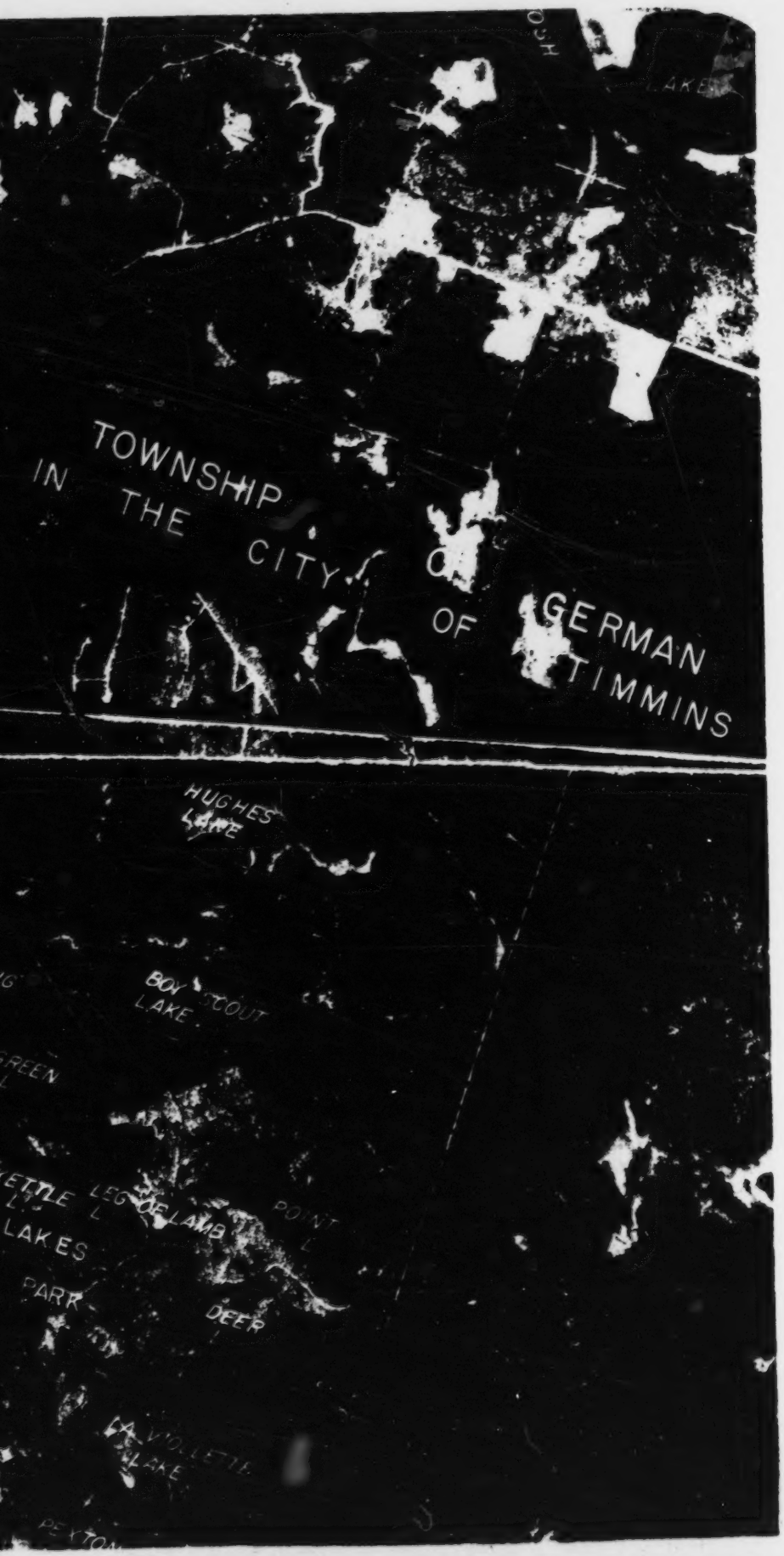

KEYSON
CON. 3
CON. 2
RIVER
TWP. OF MATHESON
LOT 12
ROMA
LAKE

MATHESON
CREEK
RIVER
HOUSE
FREDERICK
TWP OF MATHESON
TWP OF CODY
LOT 1
CON. I

CON 3
CON 2
MATHESON
FREDERICK
TWP OF MATHESON
TWP OF CODY
LOT

CON 5
RIVER
BARBERS
CON 4
IN
CHARLAND
LAKE
CON 3
McINNIS
LAKE
HEART
L
KEG
L
SPRING
L
TAMARACK
L
IRRIGATION
LAKE
PINE
L
GREEN
L
GAS PIPELINE
BULLFROG
LAKE
CON 2
KETTLE
PROVINCIAL
KETTLE
LAKES
LEG
L
PARR
SLAB
L
CON 1
PEXTON

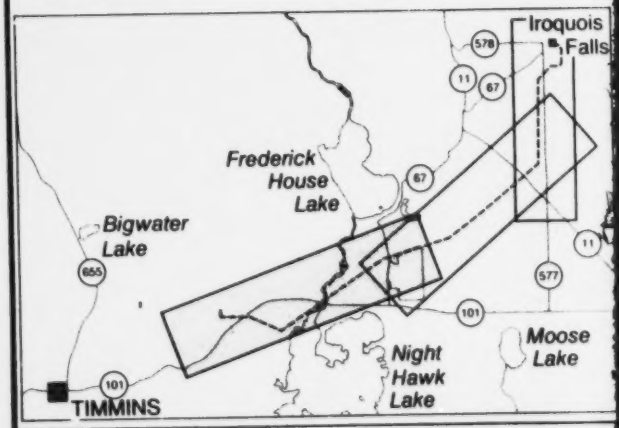
CON 5
CON 4
CON 3
CON 2
CON 1
HOUSE
RIVER
BARBERS
CHARLAND LAKE
McINNIS LAKE
HEART L
TAMARACK L
PINE L
BULLFROG LAKE
KETTLE PROVINCIAL
SLAB L



Legend

Recommended Route

Figure 11.1a



Ontario Hydro
Design and Development
Division – Transmission

Supply to Abitibi-Price (Iroquois Falls)
Recommended Route

Drawn by: D.W	Graphics Production Supervisor: DSH
Date: March, 1986	Co-ordinating Planner:
Work Order: 830 03720 60	Project Engineer:
Scale: 1:25,000	Drawing No:
Rev: 0	Sheet: 11

TOWNSHIP
IN THE CITY
HUGHES
LAKE
BOY SCOUT
LAKE
POINT
L
DEER
L
LEG OF LAMB
L
KETTLE
L
LAKES
PARK
VIOLLETTE
LAKE
GREEN
L
KEG
L
SPRING
L
MCINNIS
LAKE
TAMARACK
L
PINE
L
HEART
L
IRRIGATION
LAKE
KETTLE
PROVINCIAL
PEXTON
LAKE
AND
LEECE
L
ELAB
L
BULLFROG
LAKE
CHARLAND
LAKE
CON 3

LAKE

CON

TWP OF DUNDONALD

TWP OF GERMAN

TWP OF CLERGUE

TWP OF STOCK

LOT 12

GERMAN

TIMMINS

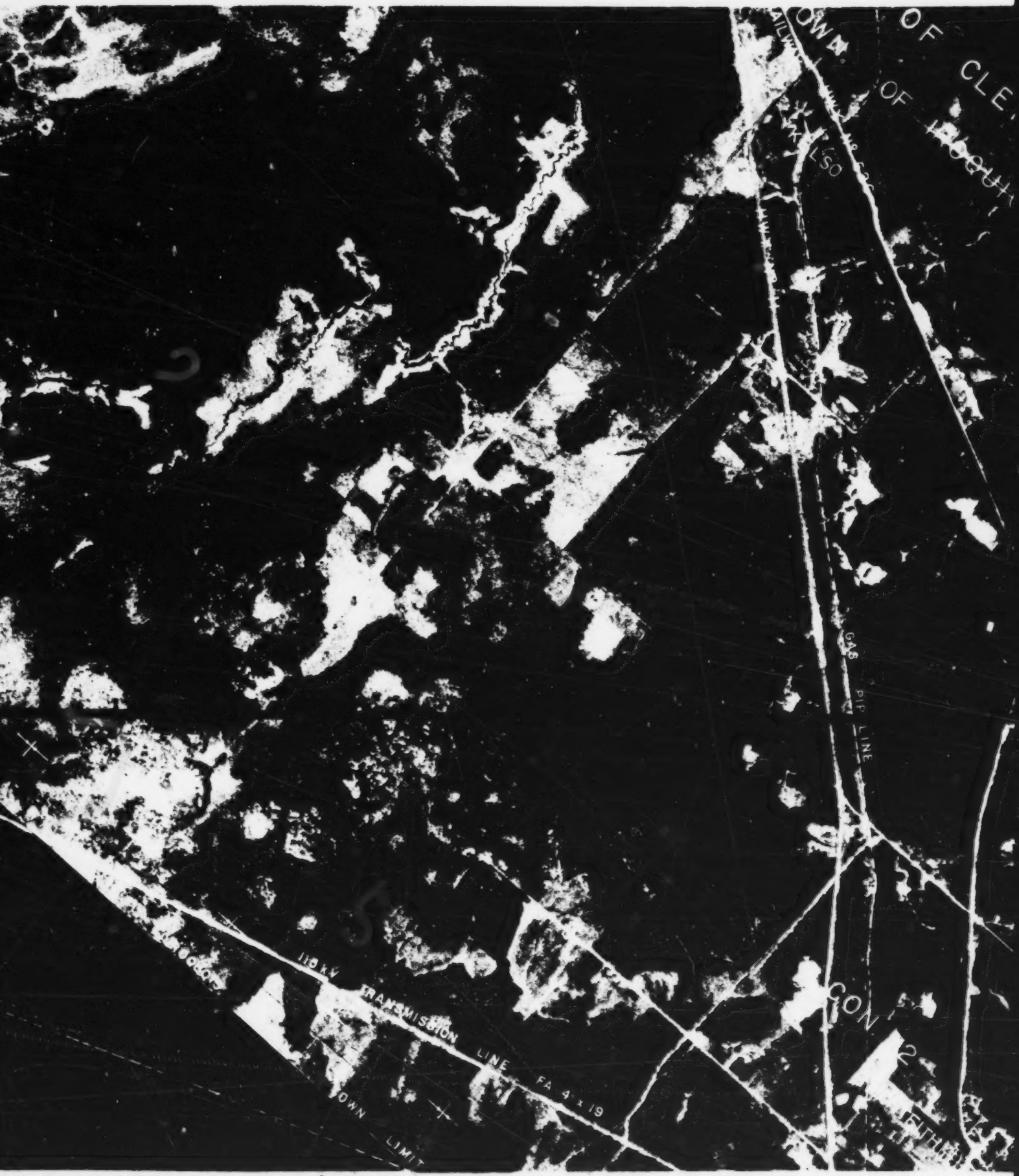
CON 6

CON 5

CON 4

TWP OF BEAR RIVER MATHESON

CON I
TWP OF DUNDONALD
TWP OF GERMAN
LOT 12
TWP. OF CLERGUE
TWP OF STOCK
CON 6
CON 5
CON 4


OF CLE
OWN OF
RAILWAY
LSO
GAS PIPE LINE
CON 2
110 KV
TRANSMISSION LINE FA 4 x 19
TOWN LIMIT

OF
OF
GAS PIP LINE
CON 2
115 KV TRANSMISSION LINE FA 4 x 19
TOWN LIMIT

CLERGUE

FALLS

CON 6

CON 5

CON 4

CON 3

TWP OF CALVERT

TWP OF CLERGUE

TWP OF TEEFY

TWP OF WALKER

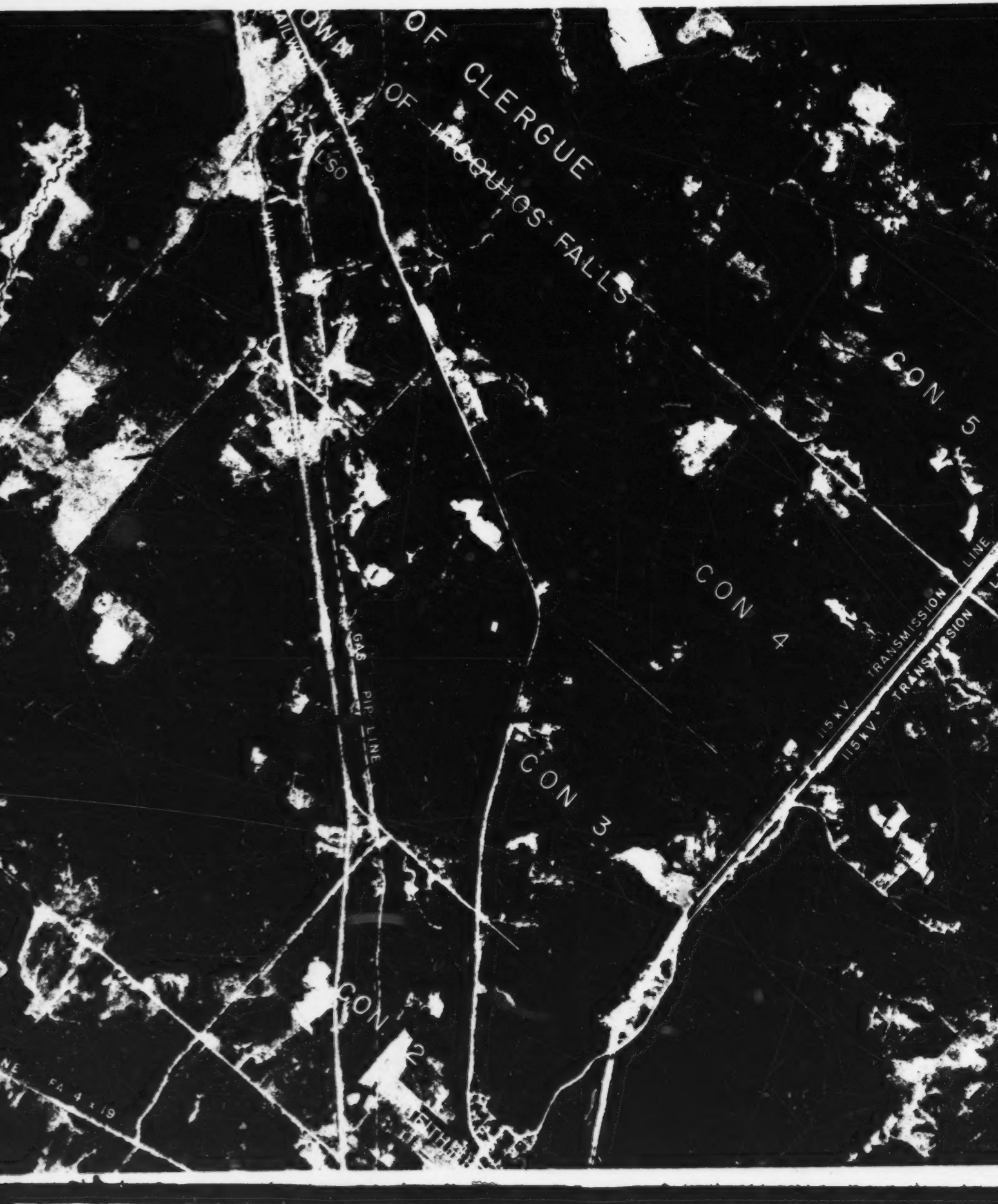
LOT

115 KV TRANSMISSION LINE

115 KV TRANSMISSION LINE

TOWNSHIP

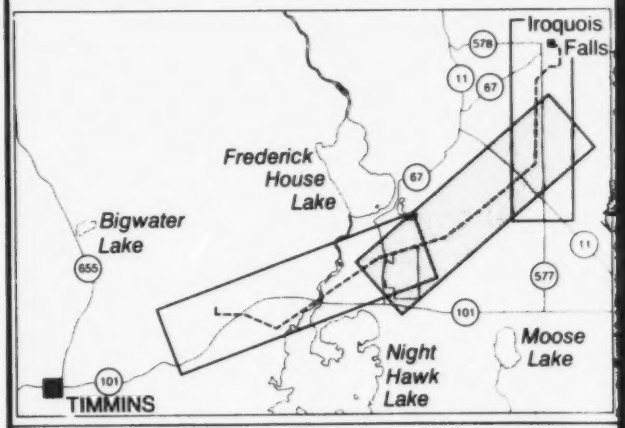
IN THE


OF CLERGUE
CON 5
CON 4
CON 3
CON 2
GAS PIPE LINE
115 KV TRANSMISSION LINE
115 KV TRANSMISSION LINE

Legend

Recommended Route

Figure 11.1b

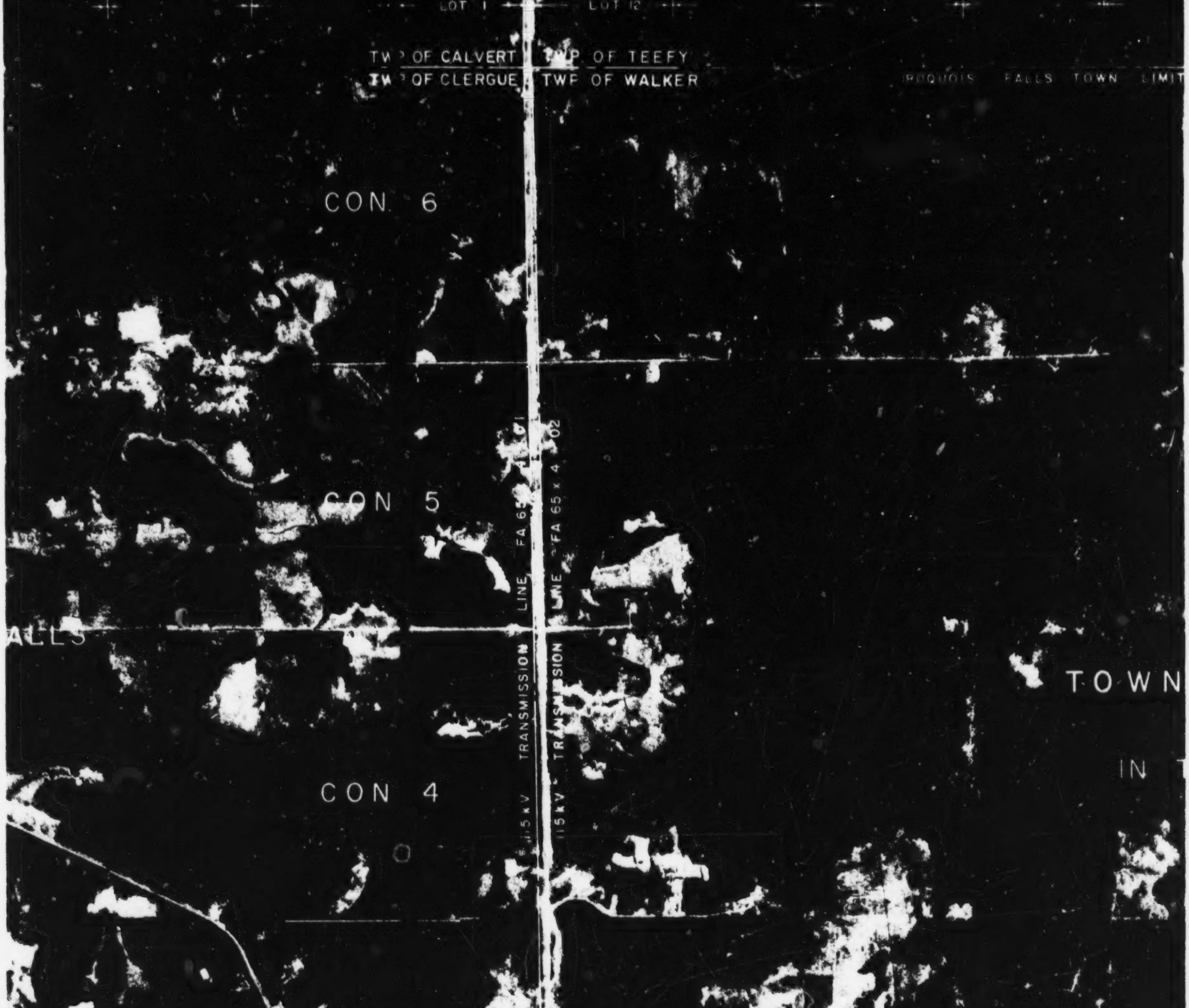


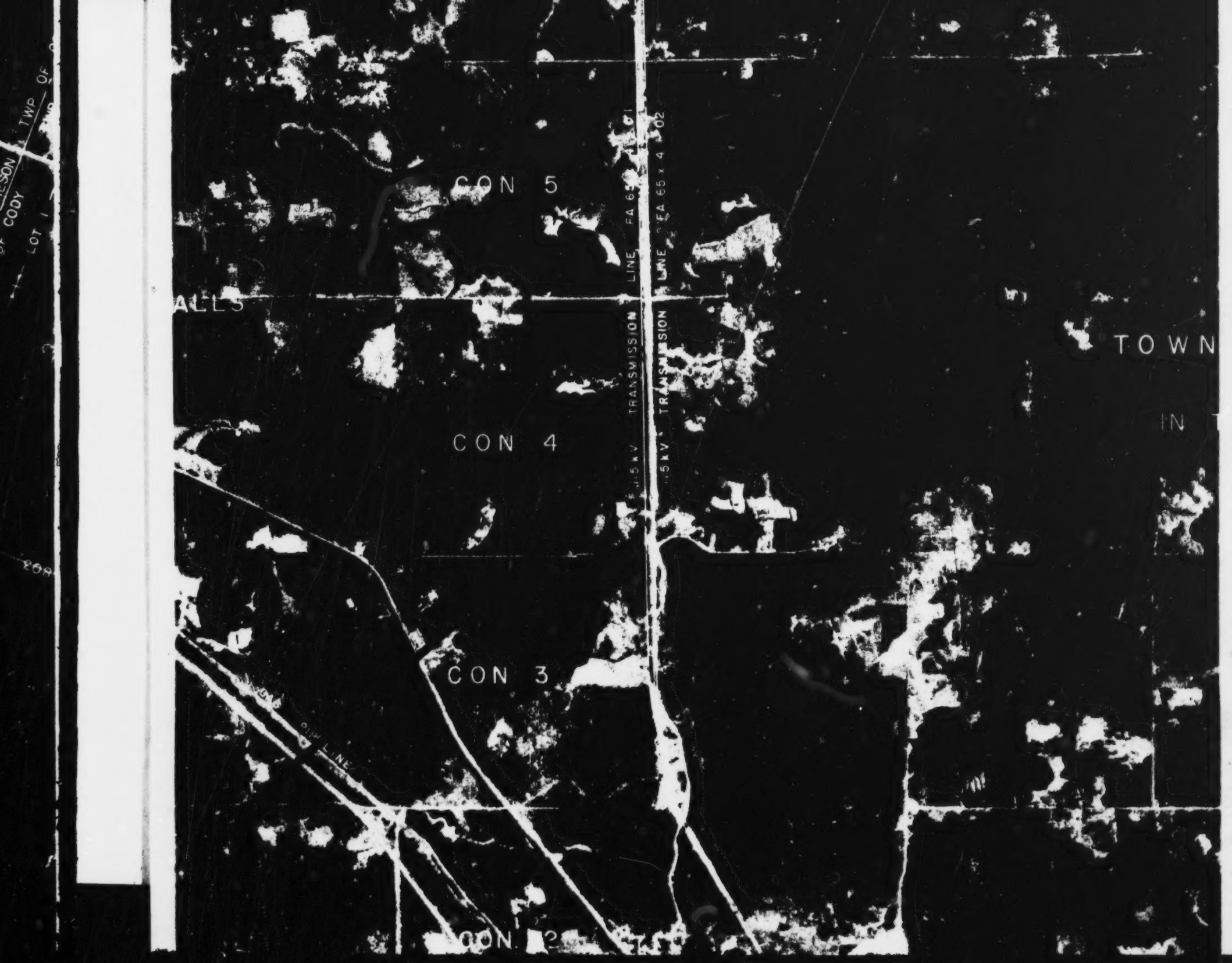
Ontario Hydro
Design and Development
Division – Transmission

Supply to Abitibi-Price (Iroquois Falls)
Recommended Route

Drawn by: D.W.	Graphics Production Supervisor: DSH
Date: March, 1986	Co-ordinating Planner:
Work Order: 830 03720 60	Project Engineer:
Scale: 1:25,000	Drawing No.
Rev: 0	Sheet: 11.1b

CON 3
PIPE LINE
CON 2
MONTEITH SS.
CON 1
IROQUOIS FALLS TOWN LIMIT
LOT 1
TWP OF CLERGUE
TWP OF STOCK
TWP OF WARK
PIPELINE


LOT 1
LOT 12
TWP OF CALVERT
TWP OF TEEFY
TWP OF CLERGUE
TWP OF WALKER
IROQUOIS FALLS TOWN LIMIT
CON 6
CON 5
CON 4
115 KV TRANSMISSION LINE
115 KV TRANSMISSION LINE
FA 65 x 4 102
TOWN
IN


CON 5
CON 4
CON 3
CON 2
TOWN
IN
TRANSMISSION LINE
TRANSMISSION LINE
PIPE LINE

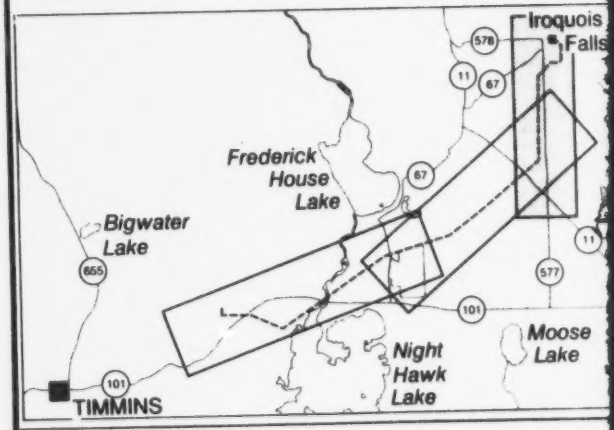
CON 3
CON 2
CON 1
CON 6
CON II
CREEK
MEADOW
ABITIBI
LOT 1
LOT 12
TWP OF CALVERT
TWP OF TEEFY
TWP OF CLERGUE
TWP OF WALKER

IROQUOIS FALLS DS
CON 3
CON 2
CREEK
ABITIBI
MEADOW
CON 1
IROQUOIS FALLS TOWN LIMIT
LOT 1
LOT 15
TWP OF CALVERT
TWP OF TEEFY
TWP OF CLERGUE
TWP OF WALKER
CON 6
CON 1

Legend

Recommended Route

Figure 11.1c



Ontario Hydro
Design and Development
Division – Transmissio

Supply to Abitibi-Price (Iroquois Falls)
Recommended Route

Drawn by D.W.	Graphics Production Supervisor DSH
Date March, 1986	Co-ordinating Planner
Work Order 830 03720 60	Project Engineer
Scale 1:25,000 / Drawing No	Rev 0

11.3 Right-of-Way

The width of the right-of-way is a function of several design considerations including structure height, distances between structures, conductor size, clearances, line security and the type of terrain crossed by the right-of-way. The normal right-of-way width for this 230 kV single-circuit line is 40 m. For those sections of the recommended route that parallel the existing 115 kV line, the distance between the centre line of the existing line and the centre line of the new 230 kV line is a minimum of 23 m. This means that the existing right-of-way will have to be widened approximately 30 m in areas of parallel. Additional property rights may be required at specific locations to accommodate site-specific design, construction, operation and maintenance concerns. The average span length is expected to be approximately 270 m.

11.4 Construction

Construction of the transmission facilities will be carried out by Ontario Hydro construction staff and/or contract forces. A set of guidelines titled "Environmental Guidelines for Construction and Maintenance of Transmission Facilities", March 1981, Revision 1, March 1986, have been prepared to ensure environmental awareness on the part of all construction staff acting on behalf of Ontario Hydro.

These guidelines are intended to minimize adverse environmental effects caused by construction, operation and maintenance of transmission facilities. Construction practices will comply with the guidelines and, where necessary, will be supplemented by specific instructions covering any environmentally sensitive areas identified during the detailed design stage.

A wide range of activities are carried out during the construction of transmission lines. Typical activities that Ontario Hydro would undertake are: temporary warehousing, construction of access roads, delivery of conductor and wood poles, conductor stringing, right-of-way clearing, soil testing and foundation construction, assembly and erection of structures, installation of counterpoise, field servicing of equipment, and right-of-way restoration and/or landscaping.

11.5 Transmission Line Operation, Maintenance and Decommissioning

11.5.1 Right-of-Way Management

Right-of-way management activities would be undertaken to ensure that the transmission facilities on the right-of-way may be operated and maintained safely, reliably and efficiently. It would include activities such as periodic tree cutting and pruning, selective herbicide application, inspection patrols, soil stabilization as necessary, and encouraging productive secondary uses of Ontario Hydro owned property.

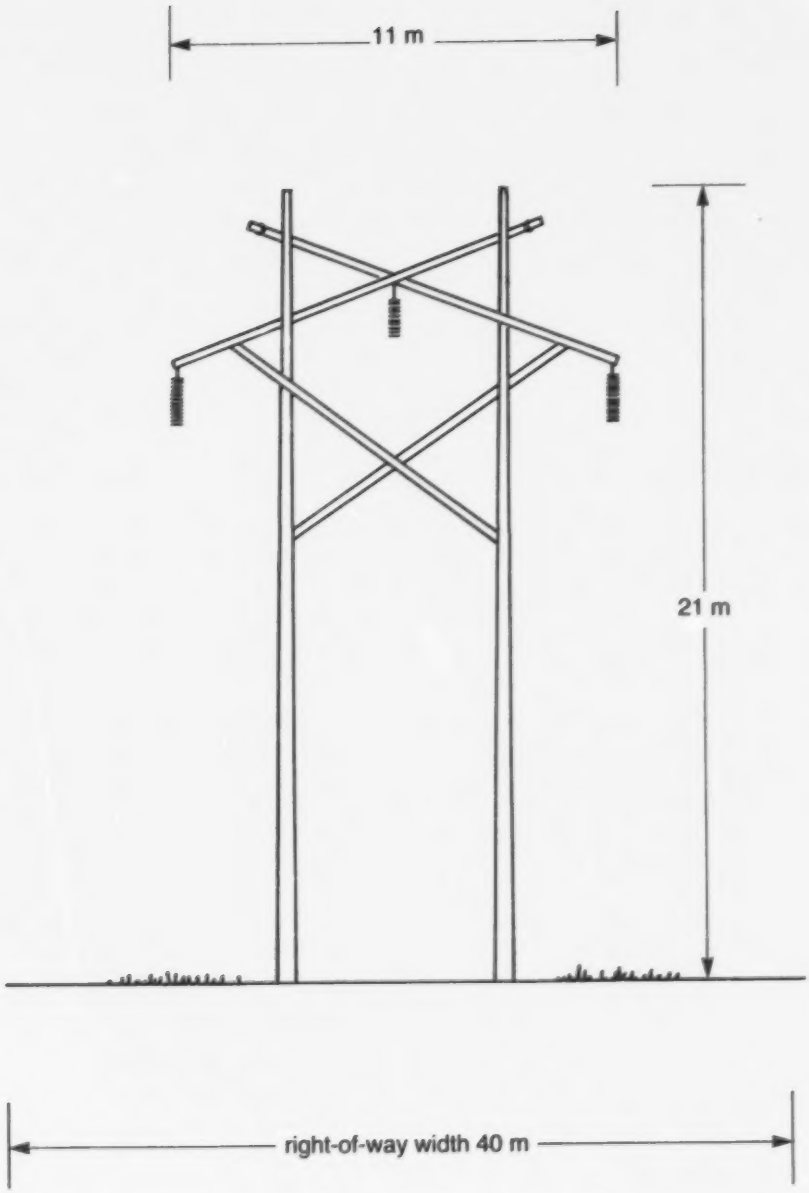


Figure 11.2
Typical 230 kV 1-cct Wood Pole

RS168 LUEP DA4 0009

One management objective would be to eliminate vegetation which is incompatible with transmission line operation and maintenance, and to encourage stable compatible vegetation. Vegetation control methods used to achieve this objective comply with government legislation, consider site specific conditions (i.e., surface and ground water) and would be carried out by trained and licensed operators.

Rights-of-way are managed by Ontario Hydro regional personnel on established maintenance cycles which consider environmental concerns and cost effectiveness. Affected government agencies (ie, MOE, MNR, Conservation Authorities and Municipalities) are consulted regarding management practices. Landowners are notified prior to work being carried out on their properties.

11.5.2 Transmission Line Maintenance

Routine visual inspections would be made of transmission lines so that corrective action could be taken before an operating problem developed (i.e., damaged insulators, tower members, hardware and conductors). In rural areas, helicopter patrols would be done about three times a year and a ground patrol once every two years. Each line would be subjected to a climbing inspection by climbing a 10 percent random sample of the towers every 10 years.

Regular maintenance and emergency repairs would be carried out as required. Regular maintenance work could usually be scheduled well ahead of time and discussed with the land owners/lessees. In planning and executing regular or routine maintenance, a major consideration would be to limit the disruption to farm practices and the environment as much as possible. Where damage is unavoidable, restoration or compensation for the cost of restoration would be provided.

Emergency repairs would require immediate action to restore the facilities and the owners would later be compensated for any damage to the property or crops.

11.5.3 Secondary Uses

The granting of any new application for the secondary use(s) of right-of-way lands would have to be technically compatible with transmission facilities, meet public safety criteria and would be subject to the terms and conditions of Exemption Order OH-27, as outlined in the Procedural Document which was approved by the Minister of the Environment on April 6, 1983.

Secondary uses of lands owned by Ontario Hydro would generally be granted where they do not conflict with adjacent owners, where they are compatible with the local community and do not interfere with Ontario Hydro's existing and projected uses of the right-of-way. These compatible uses include a continuance of the present use(s), agriculture, market gardening, garden plots, nurseries, industrial storage, utility pipelines, parks, recreation facilities and parking lots.

11.5.4 Decommissioning

Experience with similar types of transmission lines indicates that the service life would be at least 50 years.

Decommissioning this line would involve either replacement or abandonment. If the line is replaced or upgraded, the construction activities and associated environmental impacts would be less than those covered in this document. If the line is abandoned, construction activities would be limited to the removal of the conductors and poles.

Access would be required to the pole locations, and the poles would be cut off below grade and covered. The affected areas would be restored to a standard set out in Section 2.8 of the "Environemental Guidelines for Construction and Maintenance of Transmission Facilities", March 1981, Revision 1, March 1986. Ontario Hydro would then consider disposal of owned right-of-way to adjacent owners if it is deemed surplus to future requirements.

12.0 POST APPROVAL WORK

After approval of the project under the Environmental Assessment Act, Ontario Hydro will apply to the Ministry of Energy for an Order-in-Council under the Power Corporation Act authorizing the acquisition of property rights for construction, operation and maintenance of the 230 kV line to Abitibi-Price Inc.

12.1 Information Centres for Affected Property Owners

The most effective means of minimizing potentially undesirable changes to the environment caused by transmission facilities is through both the careful location of the right-of-way and the design of the transmission facilities.

Following government approval of the project, Ontario Hydro will hold a of public information centre for affected property owners. At this centre Ontario Hydro personnel will be present to answer any questions the property owners may have and to explore their concerns prior to negotiations for property rights or expropriation.

Ontario Hydro will then complete the right-of-way finalization studies and proceed to detailed design.

Concerns that have been raised and the commitments that have been made by Ontario Hydro during the route selection stage - as well as any conditions of approval which may result from the government review or an Environmental Assessment Board hearing - will be implemented during the design and construction phase.

12.2 Final Design

The final design will be based on more detailed environmental and engineering data obtained in the field. Through consultation with property owners, provincial ministries and land-use permit holders, plans will be developed to identify locations for structures, access roads and staging areas. These plans will show specific areas for clearing, restoration and management of the right-of-way together with environmentally sensitive areas, including stream crossings and any specific mitigation measures intended for these areas. Archaeological surveys and reports will be produced for those areas where high potential areas have been identified. The Ministry of Citizenship and Culture would be consulted to assist in determining specific areas of high archaeological potential.

Final field checking cannot be done until property rights have been obtained. The final locations, construction methods and access routes cannot be set until immediately prior to construction. The following documents will be filed with the Ministry of the Environment prior to the start of construction.

Construction Access Plan - This plan shows the proposed location of structures and access roads to be used for construction and forestry activities. In addition, it shows any environmentally sensitive areas and the specific mitigation techniques which are planned.

Construction Schedule - This shows when Ontario Hydro plans to conduct the construction activities.

12.3 Property Acquisition

All rights to property required for the undertaking will be acquired in accordance with Ontario Hydro policy and settlements will be concluded in accordance with the procedures provided under the Expropriation Act. Any land which Ontario Hydro is required to purchase which becomes surplus to its needs may be disposed of by sale. Ontario Hydro usually offers these lands to former owners, adjacent owners, public utilities, government and government agencies prior to offering to the public. Sales to the public will vary with the circumstances and may be through public tender, real estate broker, auction or option.

12.4 Construction

Prior to beginning field activities, an Ontario Hydro representative will be given responsibility for co-ordinating property owner contacts regarding surveys, property rights acquisition, soil testing, construction and restoration practices.

The construction of the line will follow the "Environmental Guidelines for Construction and Maintenance of Transmission Facilities", March 1981, Revision 1, March 1986, approved by the Ontario government. These guidelines will be used by all personnel involved in the design, construction and maintenance of the line in order that the work may be accomplished without causing undue adverse environmental changes. The guidelines will apply whether the work is carried out by Ontario Hydro or by contract forces.

Construction operations during installation of a transmission line are generally of short duration and at intermittent locations along the route of the line. Ontario Hydro is committed to follow the Protocol for Community Noise Control during the construction of transmission lines and all related facilities such as transformer stations (as agreed between the Ministry of the Environment and Ontario Hydro). These transmission facilities are designed according to the standards noted in the Protocol.

The construction equipment is operated in accordance with sound emission standards as referenced in the Model Municipal Noise Control By-law. The condition of the machines is monitored by our forces in order to comply with worker safety standards since noise is considered a designated substance.

The hours of work for construction comply with the requirements in the Model Municipal Noise Control By-law. Ontario Hydro practice is to carry out construction, operation and maintenance according to the Model By-law in all areas, even if the local municipality has not enacted the Model By-law.

It is mandatory that crew briefing on minimizing environmental damage take place prior to commencement of field work. Environmentally Sensitive Areas will be handled according to the special mitigation outlined on the Construction Access Plan.

Contact will be maintained throughout the construction phase of the project through field visits and letters to the local MPs, MPPs, municipal officials, and the study mailing list. News releases will be issued at significant stages to inform the local public of the project status.

12.5 Environmental Monitoring

As construction proceeds, the Construction Access Plan filed with the Ministry of the Environment will be monitored closely. The actual conditions which occurred on site and deviations from the proposed mitigation and actual structure location will be noted. Following completion of construction and restoration of the right-of-way, any changes will be noted on the Construction Access Plan, and this revised plan will be filed with the Ministry of the Environment as an "as constructed" plan.

APPENDIX A

LAND USE AND ENVIRONMENTAL RESOURCES

A1 - Data Types and Sources

A2 - Environmental Objective Statements

APPENDIX A1

DATA TYPES	SOURCES
HUMAN SETTLEMENT	
Existing Land Use	
- residential, institutional, industrial and commercial buildings including outbuildings - seaplane bases and airports - communication facilities - roads, railways, transmission facilities and gas pipelines - cemeteries	- 1:50,000 NTS mapping - 1984 OBM aerial photography - windshield survey along all public roads within the study area
Municipal Planning Designations	
- official plan land use designations - zoning by-law designations	- City of Timmins Official Plan (1979) - City of Timmins Zoning By-law (1977-850) - Township of Black River - Matheson Official Plan (1979) - Township of Black River - Matheson Zoning By-law (398-79) - Town of Iroquois Falls Official Plan (1973) - Town of Iroquois Falls Zoning By-law (1901-77)
Land Tenure	
- private, public and crown lands and associated boundaries	- Cochrane - Timiskaming Assessment Office (Timmins) - Ministry of Natural Resources Timmins and Kirkland Lake Districts
Proposed Developments	
- proposed provincial, municipal and private developments	- discussion with R. Peterson (Director of Planning, City of Timmins), J. Buchan (Clerk/Treasurer, Town of Iroquois Falls) and T. Monahan (Clerk/Treasurer, Township of Black River - Matheson) - Ministry of Natural Resources, Timmins and Cochrane

DATA TYPES	SOURCES
AGRICULTURAL RESOURCES	
Existing Agricultural Land Use	
- active and dormant agriculture lands	- airphoto interpretation at a scale of 1:24,000
Agricultural Capability	
- soils critical and supplementary for agricultural production	- Ministry of Natural Resources Background Information Reports for Timmins, Cochrane and Kirkland Lake Districts (1981) - Ministry of Agriculture and Food, Matheson, D. Blaguiere
FOREST RESOURCES	
Forest Capability	
- high capability lands for forest production	- Canada Land Inventory
Forest Management Areas	
- regeneration areas - areas to be harvested by the year 2001	- Ministry of Natural Resources staff, Timmins, Cochrane and Kirkland Lake Districts - Ministry of Natural Resources Background Information Reports for Timmins, Cochrane and Kirkland Lake Districts (1981)
Existing Forest Cover	
- coniferous, deciduous and mixed forests of varying ages	- Forest Resources Inventory mapping (1978-79 aerial photography) - 1984 OBM aerial photography at 1:50,000
BIOLOGICAL RESOURCES	
Wildlife Resources	
- moose wintering areas - moose aquatic feeding areas - waterfowl production and staging areas - sensitive wildlife habitats	- Ministry of Natural Resources Background Information Reports (1981) and files from the Timmins, Cochrane and Kirkland Lake Districts

DATA TYPES	SOURCES
Fisheries Resources	
- cold water sport fish habitat - warm water sport fish habitat	- same as for "Wildlife Resources"
RECREATION RESOURCES	
Existing Recreation	
- provincial, municipal and private parks and campsites - resorts, lodges, youth camps cottages, marinas, ski trails and access points - outpost camps, hunt camps and remote cottages	- 1:50,000 NTS mapping - 1984 OBM aerial photography at 1:50,000 - Ministry of Natural Resources Background Information Reports (1981) and files for Timmins, Cochrane and Kirkland Lake Districts - Abitib/DeTroyes Provincial Park - Interim Management Statement, Northern Region, MNR, 1985. - windshield surveys along public roads
Viewsheds	
- viewsheds of canoe routes and remote roads	- 1:50,000 NTS mapping aerial mosaics and stereo air photos to determine extent of viewsheds
HERITAGE RESOURCES	
Known and Potential Areas	
- known archaeological sites - known historic sites and trails - areas of archaeological potential	- Ministry of Citizenship and Culture, Regional Archaeologist, T. Conway - Timmins Museum, Curator, K. Doherty - Black River - Matheson Museum, Curator, Mrs. T. Mile - Local Historian in Kelso, A. Boyd
MINERAL RESOURCES	
Mining Resources	
- active, dormant and proposed mining areas - areas of high mineral potential	- Ministry of Natural Resources, Mining Recorder and Regional Geologist in Timmins and

DATA TYPES	SOURCES
- mining claims	Kirkland Lake - Ministry of Natural Resources Background Information Reports for Timmins, Kirkland Lake and Cochrane Districts (1981) - Kidd Creek Mines, Falconbridge Mines and Associated Porcupine - 1984 OBM aerial photography at 1:50,000 - Ontario Mineral Potential Map P-1517, M.N.R., 1977
Aggregate Resources	
- active and dormant sand and gravel pits - Crown aggregate reserves - critical and significant aggregate reserves	- Ministry of Natural Resources Background Information Reports (1981) and files for Timmins, Cochrane and Kirkland Lake Districts
Geological Features	
- bedrock geology - surficial geological - unique geological features	- "Geology of the Night Hawk Lake Area - District of Cochrane" E.J. Leahy, Dept. of Mines and Northern Affairs, Geological Report 96, 1979. - Northern Ontario Engineering Geology Terrain Study - Data Base Maps for Timmins (5029) Pamour (5026), Kirkland Lake (5030) and Iroquois Falls (5027), M.N.R. - Ministry of Natural Resources Timmins, Cochrane and Kirkland Lake District Office files

APPENDIX A2

ENVIRONMENTAL OBJECTIVE STATEMENTS

HUMAN SETTLEMENT - 1* (1)**

Title: Avoid existing residential, commercial, industrial and institutional developments, in addition to airfield/seaplane bases, communication structures, waste disposal areas and cemeteries.

Value of Resource:

- services and buildings represent an economic and social investment on the part of the owners and the community
- suitable alternative sites for the services or buildings may not be available within a reasonable distance of their present location
- services and buildings form an integral part of the communities social and economic fabric

Potential Change:

- possible removal of existing buildings or structures due to land use restrictions within the right-of-way (ROW)
- disruption to existing land use patterns and associated activities
- influence on future land use patterns and development
- access roads and the ROW may provide new and uncontrolled access
- construction activities may alter ambient levels of noise, dust and fumes

Possible Mitigation Measures:

- minimize interference with existing land use patterns; e.g., by consulting with local planning authorities, maximizing opportunities for joint use of the ROW, maintaining recognized clearance at airfield and seaplane bases, etc.
- minimize noise, dust and fumes; e.g., by scheduling construction activity, applying special construction techniques, etc.
- minimize changes in access; e.g., by consulting with affected land owners, erecting gates, limiting number of new access roads maintained after construction, etc.

* - ranked order within the factor category
** - overall ranked order

Net Impact:

- possible change in patterns of future development
- possible disturbance to residents by users of the ROW
- economic costs and emotional stress associated with possible relocation of dwellings or facilities
- open space created by the ROW can act as a buffer between different land uses (positive impact)
- possible joint use of the ROW by other compatible activities (positive impact)

HUMAN SETTLEMENT - 2 (4)

Title: Avoid areas designated on the official plans for residential and institutional development

Value of Resource:

. approval of official plan land use designations represent an economic and planning investment on the part of the community

. viable alternative areas may not be available within the planning jurisdiction

. installed services represent an economic commitment to the area

Potential Change:

. possible disruptions to planned development patterns in the area

. suitable alternative land may not be available within the planning jurisdiction

. designation of alternate lands requires amendments to the official plan

Possible Mitigation Measures:

. minimize interference with designated land use patterns by; e.g., consulting with local planning authorities, maximizing opportunities for joint use of the ROW by locating the ROW on or parallel to the boundary between different land use designations, etc.

Net Impact:

. possible change in type, patterns and staging of future development

. open space created by the ROW can act as a buffer between different land uses; (positive impact)

. economic costs incurred through the unrealized potential of installed services

HUMAN SETTLEMENT - 3 (14)

Title: Avoid areas designated on the official plans for commercial and industrial development

Value of Resource:

. approval of official plan land use designations represent an economic and planning investment on the part of the community

. alternative land may not be available within the planning jurisdiction

. installed services represent an economic commitment to the area

Potential Change:

. possible disruption to planned development patterns in the area

. suitable alternative land may not be available within the planning area

. designation of alternate lands require amendment to the official plan

Possible Mitigation Measures:

. minimize intereference with designated land use patterns by: e.g., consulting with local planning authorities, maximum opportunities for joint use of the ROW, locating the ROW on or parallel to the lines between different land use designations, etc.

Net Impact:

. possible change in pattern and staging of future development

. open space created by the ROW can act as a buffer between different land uses (positive impact)

. economic costs incurred through the unrealized potential of installed services

HUMAN SETTLEMENT - 4 (18)

Title: Avoid close parallel situations in areas designated on the official plans as hazard lands

Value of Resource:

- areas can act as water retention or water recharge for the vicinity
- provide pathways for wildlife in the area
- form natural windbreaks for wildlife shelter, prevention of soil erosion and field micro climates inducive to specialty crop production

Potential Change:

- disruption of the natural water retention capability of the area though increased evaporation and surface runoff
- disruption of the mobility patterns of the local wildlife populations
- clearing associated with transmission lines could; e.g., remove shelter required by wildlife during adverse weather conditions, cause erosion of soil, alter local field micro climates thereby disrupting the moisture/temperature requirements for certain specialty crops

Potential Mitigation Measures:

- minimize changes to the tree cover by crossing forested river valleys at right angles
- minimize impact on the natural setting of the rivers by; e.g., crossing at right angles, crossing in areas with high banks, selective cutting near rivers edge and edge of the ROW
- minimize affects on water retention/recharge by strategically locating access roads

Net Impact:

- some disruption to local wildlife ranging patterns
- possible alterations to the areas water retention, water recharge or soil micro climate regime

AGRICULTURAL RESOURCES - 1 (4)

Title: Avoid active and dormant agricultural areas

Value of Resource:

- these lands have been or are presently under agricultural production and fall within agricultural capability classes 3 and 4 (CLI)
- agricultural areas represent significant levels of capital investment and are vulnerable to shifts in the economic climate and natural environmental factors
- these areas supply the local markets
- agricultural areas are generally confined to the Timmins-Matheson-Ramore corridor
- agriculture provides an important contribution to the local and regional economy
- future demand for agricultural products will result in increased intensity and acreage of individual operations

Potential Change:

- loss of standing crop during construction
- compaction, rutting, soil mixing and soil erosion related to construction activities may alter potential of soil for agricultural production
- possible damage to tile fields related to construction activities may alter soil moisture conditions
- possible removal of fences, stiles and other structures during construction
- noise and construction related disturbances may affect livestock behaviour
- presence of structures, guys and access roads may result in decrease in total acreage available for cultivation

Possible Mitigation Measures:

- minimize impact on cultivated fields through structure location along lot lines, field boundaries, etc.

- minimize loss of standing crop through project scheduling, limiting width and number of access roads, limiting size of work area, etc.
- minimize soil disturbance by using soft track equipment and road mats, limiting width and number of access roads, limiting size of work area, scheduling of construction activities, applying appropriate restoration measures, etc.
- minimize damage to tile beds through consultation with property owner regarding tile location, applying appropriate protection techniques, repairing and replacing damaged tiles, etc.
- minimize disturbance to farm operations through consultation with property owner regarding construction scheduling, work plan layout, e.g., structures and access roads

Net Impact:

- loss of usable land around structure base and guys
- reduced crop yields due to soil compaction
- possible reduced level of efficiency to some individual farm operations
- possible reduced revenues associated with the above

AGRICULTURAL RESOURCES - 2 (6)

Title: Avoid lands designated as critical for agricultural use

Value of Resource:

- these soils possess soil capability of class 3 (CLI)
- these lands have jointly been designated by MNR and MAF as critical to meet the regions requirements in agricultural production
- being so designated these lands are subject to certain strategies aimed at discouraging incompatible land use
- these lands have been identified by federal and provincial agencies as having special significance for agricultural production

Potential Changes:

- compaction, rutting, soil mixing and erosion related to construction activities may alter the potential of these soils for future agricultural production
- presence of structures, guys, access roads may remove land from future agricultural production
- presence of the ROW and access roads may provide new access to previously remote areas
- presence of the ROW, access roads and staging areas may increase amount of cleared land available for agricultural production

Possible Mitigation Measures:

- minimize amount of land lost to future agricultural production through consultation with government and other agencies and crossing lands so designated at right angles and at the narrowest point where possible, minimizing number of towers, etc.
- minimize soil disturbance through scheduling of operations and limiting width of access roads and size of work areas
- maximize opportunities for joint use of the ROW and access roads by consulting with property owners, locating the ROW along edges of existing operations, using compatible vegetation control measures, etc.

Net Impact:

- loss of land available for future production at and around structures and under access roads
- possible decrease in soil productivity for future agricultural production
- possible increase in land available for cultivation due to clearing and provision of access
- overall net impact will be dependent upon future demand for agricultural products and other economic considerations

AGRICULTURAL RESOURCES - 3 (19)

Title: Avoid lands designated as supplementary for agricultural use

Value of Resource:

- these soils possess soil capability of class 4 (CLI)
- these lands have jointly been designated by MNR and MAF as supplementary to meet the regions requirements in agricultural production
- being so designated these lands are subject to certain strategies aimed at discouraging incompatible land use
- these lands have been identified by federal and provincial agencies as having potential for agricultural production however with certain limitations

Potential Changes:

- compaction, rutting, soil mixing and erosion related to construction activities may alter the potential of these soils for future agricultural production
- presence of structures, guys, and access roads may remove land from future agricultural production
- presence of the ROW and access roads may provide new access to previously remote areas
- presence of the ROW, access roads and staging areas may increase amount of cleared land available for agricultural production

Possible Mitigation Measures:

- minimize amount of land lost to future agricultural production through consultation with government and other agencies, crossing lands so designated at right angles and at the narrowest point where possible, minimizing number of towers, etc.
- minimize soil disturbance through scheduling of operations and limiting width of access roads and size of work areas
- maximize opportunities for joint use of the ROW and access roads by consulting with property owners, locating the ROW along edges of existing operations, using compatible vegetation control measures, etc.

Net Impact:

- loss of land available for future production at and around structures and under access roads
- possible decrease in soil productivity for future agricultural production
- possible increase in land available for cultivation due to clearing and provision of access
- overall net impact will be dependent upon future demand for agricultural products and other economic considerations

FOREST RESOURCES - 1 (8)

Title: Avoid forest regeneration areas

Value of Resource:

- these areas support the forest industry by providing increased quality and productivity to forest stands
- they represent a level of investment by governmental agencies and the forest industry
- these areas are limited in size and number within the study area
- forest regeneration areas are maintained to provide an adequate stock of high quality wood fibre for future requirements

Potential Change:

- tree cover will be removed on the ROW and access roads
- construction activities may alter soil and surface drainage patterns creating a shift in site productivity beyond the ROW
- loss of results from experimental and research programs

Possible Mitigation Measures:

- limit number of access roads maintained after construction
- attempt to cross these areas at right angles or at the narrowest point where possible
- limited further mitigation measures available; consult with appropriate agencies prior to construction

Net Impact:

- possible loss of scientific and management information due to disruption of forest research projects
- loss of investment due to removal of trees
- loss of growing stock on regeneration sites and interference with reforestation operations
- possible interference with ongoing research and management efforts due to new and uncontrolled access
- alteration of tree growth adjacent to the ROW due to changes in site conditions

FOREST RESOURCES - 2 (20)

Title: Avoid areas designated for harvesting to the year 2001

Value of Resource:

- these areas have been designated for future harvesting activities by the MNR Northeast Region and the MNR Timmins and Cochrane Districts land use plans
- these areas are necessary to ensure the continued viability of the local forest products industry
- the forest industry is a significant contributor to the local and provincial economies
- regeneration of forest stock to harvestable stage occurs over long periods of time
- harvesting operations involve considerable investments by the forest industries and government agencies and are subject to fluctuations in the world market

Potential Change:

- loss of tree stock due to the ROW and access road construction
- presence of structures, guys and conductors may affect efficient operation of forest harvesting equipment
- presence of access roads and the ROW may allow new and uncontrolled access
- construction activities may result in alterations to operation plans and harvesting logistics

Possible Mitigation Measures:

- attempt to cross harvesting areas at right angles and at the narrowest point where possible
- minimize conflicts with operating plans through consultation with harvesters and government agencies
- limited mitigation measures available, consult with appropriate agencies and harvesters prior to construction

Net Impact:

- loss of forest along ROW and access roads
- reduced efficiency of operations due to presence of the ROW

- loss of revenue associated with the above
- possible increased interference with operations due to new and uncontrolled access
- possible improvement in access to previously remote areas (positive impact)

FOREST RESOURCES - 3 (23)

Title: Avoid areas of high capability for forest production

Value of Resource:

- these lands have the greatest potential for the production of merchantable timber
- lands with these characteristics are limited in extent within the study area
- regeneration periods for harvestable forest resources are relatively long

Potential Change:

- presence of the ROW and access roads decreases the amount of land available for forest production
- presence of the ROW and access roads may provide for new and uncontrolled access
- construction activities may cause erosion, change in soil drainage patterns, changes in local microclimate, and changes in surface drainage patterns which may affect site conditions for forest production beyond the ROW
- presence of structures, guys and conductors may interfere with special forest harvesting equipment in future cutting areas

Possible Mitigation Measures:

- minimize loss of productive lands by crossing at right angles and at the narrowest point where possible, limiting width, length and number of access roads and limiting the extent of the work areas
- minimize soil erosion by practising selective cutting and applying mechanical control measures
- minimize soil disturbance by scheduling construction activities and the installation of culverts, and by applying proper restoration practices
- maximize opportunities for joint use of access roads and the ROW through consultation with government agencies and harvesters

Net Impact:

- loss of productive land within the ROW and under access roads
- adverse effects on site conditions adjacent to the ROW leading to decreased productivity
- reduced efficiency in operation of harvesting equipment in future cutting areas
- loss of revenues to the individual companies and the province due to loss of productive land
- possible improvement in access to previously remote areas (positive impact)

BIOLOGICAL RESOURCES - 1 (5)

Title: Avoid sensitive areas as identified by the Ministry of Natural Resources

Value of Resource:

. these areas provide educational and research opportunities

. these represent areas of local, regional and/or provincial significance

Potential Change:

. ROW or access road clearing, construction, and maintenance activities on or adjacent to these areas may result in a partial to total loss of these resources

Possible Mitigation Measures:

. mitigation is limited, however, MNR should be consulted prior to construction to determine the most appropriate measures

Net Impact:

. increased stress or loss of associated floral or faunal species due to adverse changes in habitat or to disturbance from work crews or other uses of the ROW

. potential loss of genetic variability within the local population

BIOLOGICAL RESOURCES - 2 (7)

Title: Avoid lakes and stream with known populations of cold water sport fish (lake trout, brook trout, rainbow trout) and known spawning grounds for both cold and warm water species

Value of Resource:

- trout species and yellow pickerel provide a considerable number of quality sport fishing opportunities for local residents and visitors
- sport fishing contributes significantly to the local tourist industry
- trout and pickerel spawning areas are critical habitat for self-sustaining populations
- cold water habitat is limited in distribution and extent within the study area

Potential Change:

- erosion caused by construction activities in and around streams and lakeshores may result in the siltation of spawning beds with resultant increases in fish egg mortalities and subsequent declines in fish reproduction success
- erosion, siltation, stream bank and bed alterations, and lakeshore and lake bed alterations due to construction activities may deteriorate benthic faunal habitat resulting in a loss or decline in food supply for local trout and pickerel populations
- clearing of streambank vegetation may deteriorate trout habitat by increasing water temperature, reducing dissolved oxygen content and removing fish food habitat
- installation and operation of stream crossings may obstruct the passage of migrating brook trout and pickerel during spawning periods resulting in a possible reduction in fish reproduction success
- the establishment of the ROW and access roads may increase the number of sport fishing opportunities available in previously remote areas

Possible Mitigation Measures:

- minimize erosion and downstream siltation problems by establishing right angled stream crossing where possible, keeping the number of stream crossings to a minimum, installing proper sized culverts, keeping the removal of streambank vegetation to a minimum and revegetating exposed soils where necessary

- schedule stream crossings to avoid periods of upstream and downstream brook trout and pickerel migration and spawning activities

- minimize the removal of lakeshore vegetation in the clearing of the ROW through selective cutting, pruning and revegetation where necessary

Net Impact:

- temporary displacement of brook trout and pickerel populations due to the presence of construction equipment in and around streams

- slight loss in fish food supply in and around stream crossing areas due to a degradation in habitat for fish food organisms

- short term degradation in downstream spawning areas with a possible reduction in reproduction success

- possible obstruction of migrating brook trout and pickerel populations if appropriate scheduling of stream crossings is not possible

BIOLOGICAL RESOURCES - 3 (12)

Title: Avoid known moose aquatic feeding areas with a high and medium potential

Value of Resource:

- moose provide a considerable number of hunting and viewing opportunities for local residents and visitors
- moose hunting contributes significantly to the local tourist economy
- moose aquatic feeding areas are critical for providing the necessary minerals and nutrients during the spring and early summer months for adults and calves

Potential Change:

- clearing of trees on perimeter of aquatic feeding area for the ROW and access roads may remove escape cover for adults and calves
- poaching may increase due to the establishment of access to previously remote areas with resultant management problems experienced by MNR staff
- alterations in drainage patterns and the establishment of access roads in and around aquatic feeding areas may degrade the quality and reduce the productivity of these areas
- moose will not frequent aquatic feeding areas in close proximity to construction activities

Possible Mitigation Measures:

- minimize the removal of peripheral forest cover through selective cutting, pruning and planting of shrubs
- control access where possible in areas where poaching is expected to be a problem through consultation with MNR
- maintain existing drainage patterns and surface flow characteristics in areas directly affected by construction activities
- schedule construction activities to avoid spring and early summer feeding periods when possible

Net Impact:

- localized reduction in escape cover for adults and calves in peripheral forested areas
- possible increase in the incidence of poaching activities due to improved access
- loss of aquatic feeding habitat due to installation of access roads and structure footings
- temporary local decline in the number of moose frequenting aquatic feeding areas being directly affected by construction activities
- possible decline in tourism revenues related to a partial loss in moose feeding habitat causing possible declines in the moose population

BIOLOGICAL RESOURCES - 4 (16)

Title: Avoid identified waterfowl production and staging areas

Value of Resource:

- local and migrant waterfowl populations provide waterfowl hunting and viewing opportunities for local residents and visitors
- the designated staging areas lie between two major flyways that are located east and west of the study area and therefore are utilized to a lesser degree

Potential Change:

- clearing of trees for the ROW and access roads may remove existing or potential nesting sites for arboreal nesting species
- construction of access roads over streams and weltand areas associated with waterfowl nesting and feeding areas may alter ground and surface water levels and surface water flows resulting in a detrimental alteration to these areas including partial removal of productive waterfowl habitat
- disturbance and noise caused by the presence of construction crews and the operation of heavy equipment may inhibit nesting activities and cause birds to flush off their nests resulting in prolonged incubation periods and causing unguarded eggs or young to be vulnerable to predators
- improved access to waterfowl habitat areas will increase the number of hunting and viewing opportunities available

Possible Mitigation Measures:

- minimize disturbance and noise levels during nesting periods through appropriate scheduling of construction activities
- minimize alterations to ground and surface water levels and flows through proper alignment of access roads and placement of culverts

Net Impact:

- increased stress and vulnerability on nesting or migratory populations related to disturbance during construction and to adverse changes in nesting and feeding habitat

- local decline in resident waterfowl population due to loss of nesting habitat

- improved access to waterfowl habitat areas may increase waterfowl hunting and viewing activities

BIOLOGICAL RESOURCES - 5 (17)

Title: Avoid known moose wintering areas

Value of Resource:

- moose provide a considerable number of hunting and viewing opportunities for local residents and visitors
- moose hunting contributes significantly to the local tourist economy
- moose wintering areas are critical for providing the necessary food and cover during the winter months

Potential Change:

- clearing of jack pine and black spruce in wintering areas will reduce the amount of cover needed during the winter months and increase vulnerability to cold and predators
- clearing of both mature deciduous and coniferous vegetation will, on the other hand provide suitable habitat for the establishment of browse vegetation
- clearing of browse will reduce the available winter food supply
- establishment of the ROW and access roads will improve access by hunters into previously remote areas thus increasing the harvest potential and possible decreasing future reproduction potential
- uncontrolled access may increase the incidence of poaching activities giving rise to management problems experienced by MNR
- the presence of work crews and the operation of construction equipment may cause local moose populations to flee into less suitable areas and expend undue amounts of energy

Possible Mitigation Measures:

- minimize the removal of coniferous vegetation through selective cutting where possible and appropriate
- selectively cut in browse areas where possible
- schedule construction to avoid work in these areas during the winter momths
- control access where necessary and appropriate after consultation with MNR

Net Impact:

- partial loss of winter cover with possible increase in predation and subsequent decline in herd size
- improved access for hunters with possible increases in the level of moose harvest and possible decline in herd size
- increased enforcement effort on the part of MNR staff due to improved access
- possible slight increase in the generation of tourist revenues due to improved access

BIOLOGICAL RESOURCES - 6 (21)

Title: Avoid lakes and streams with known populations of warm water sport fish (yellow pickerel, northern pike and smallmouth bass)

Value of Resource:

- the warm water fish species provide the largest portion of sport fishing opportunities in the study area
- sport fishing contributes significantly to the local tourist industry
- warm water habitat is more widely distributed and more abundant than cold water habitat

Potential Change:

- erosion caused by construction activities in and around streams, lakeshores and marshes may alter benthic faunal habitat resulting in a loss of fish food supply
- removal of streambank and lake shoreline vegetation and physical alterations to stream bed and lake littoral zones may deteriorate or remove fish food habitat for fry and adults
- the establishment of the ROW and access roads may increase the number of sport fishing opportunities available in previously remote areas and increase MNR's enforcement effort

Possible Mitigation Measures:

- minimize erosion and siltation problems by establishing right angled stream crossings where possible and appropriate, keeping the number of stream crossings to a minimum, installing proper sized culverts, keeping the removal of streambrank and lakeshore vegetation to a minimum and revegetating exposed soils where necessary
- minimize the length of time and area in which construction equipment operates in streams and lake shoreline areas to reduce physical alterations to these areas
- where applicable, control access to previously remote areas if enforcement problems arise for MNR staff

Net Impact:

- temporary displacement of warm water species due to the presence of construction equipment in and around streams and lakes

- slight loss in fish food supply in and around stream crossings and disturbed lakeshore areas due to a degradation in habitat for fish food organisms

- possible increase in warm water fishing pressure in previously remote areas

RECREATION RESOURCES - 1 (2)

Title: Avoid Kettle Lakes Provincial park, nature reserves, youth camps, outpost camps, hunt camps, cottages, resorts, local parks, campgrounds, marinas and access points

Value of Resource:

- these areas provide opportunities for a wide range of recreational activities, both active and passive
- economic investment has been made in the development and operation of these recreational facilities
- Kettle Lake and Abitibi/DeTroyes Provincial Parks are the only provincial parks in the study area
- existing facilities make an important contribution to the tourism economy of the region
- possible lack of suitable alternative sites for these facilities

Potential Change:

- presence of structures, guys and conductors may alter landscape character through contrast between transmission facilities and natural elements and interference with views to points or features of interest
- clearing associated with transmission facilities may alter landscape character due to creation of sharp edges that are out of character with natural vegetation patterns and creation of long views along or from the ROW
- access roads and the ROW could provide new access to the area
- construction activities may increase ambient levels of noise, dust and fumes
- construction activities may displace certain recreational activities if close to ROW
- possible removal of associated buildings or structures due to clearance restrictions of transmission lines
- presence of structures, guys and conductors may interfere with boat launching at marinas and official access points

Possible Mitigation Measures:

- minimize visability of the transmission facilities and possible changes to the landscape character; e.g., by applying selective cutting practices, planting vegetative screens, strategically locating new access roads, etc.

- minimize noise, dust and fumes; e.g., by scheduling construction activities, applying special construction techniques, etc.

- minimize interference with boat launching and maintenance activities; e.g., design and construct additional clearance into the facility, strategic placement of structures and where appropriate adjustments in span lengths

- minimize changes in access; e.g., by consulting with affected owners, erecting gates, limiting number of new access roads and roads maintained after construction, etc.

Net Impact:

- deterioration in the quality of visitor experience due to changes in the character of the landscape

- possible interference with interpretive or educational programs related to biological or physical features

- possible decline in use of these areas related to adverse changes in setting

- economic costs and emotional stress assocated with relocation of buildings

- disturbance to property owners wherever new access cannot be controlled

RECREATIONAL RESOURCES - 2 (13)

Title: Avoid close parallel situations to designated canoe routes, remote roads and associated viewsheds

Value of Resource:

- these areas provide opportunities for an intimate experience with nature and for direct contact with one's surroundings
- these areas possess characteristics which are uniquely suited to attract and sustain these activities
- the contributions of landscape character to the quality of a canoeing experience is reflected in MNR's restrictions on timber harvesting adjacent to canoe routes
- canoe routes are of local, regional and provincial significance
- activities associated with canoeing and motoring vacations contribute to tourism revenues for individual operators and the local economy

Potential Change:

- presence of structures, guys and conductors may alter landscape character through changes in perception of scale relationships, contrast between transmission facilities and natural elements and interference with views to points or features of interest
- use of ROW and access roads by trail bikes and all terrain vehicles, etc., may increase disturbance to users of these resources
- construction activities may increase ambient levels of noise, dust and fumes

Possible Mitigation Measures:

- minimum visibility of the transmission facilities: e.g., by applying selective cutting practices, planting vegetative screens, strategically locating new access roads, etc.
- minimize changes to landscape character; e.g., by selective cutting at ROW edge, maintaining cover of compatible species on ROW, etc.
- minimize noise, dust and fumes; e.g., by scheduling construction activities, applying special construction techniques, etc.

Net Impact:

- deterioration in the quality of recreational experience due to changes in the landscape character

- sensitivity to these changes is heightened due to visitor expectations, direct contact with natural surroundings associated with these activities, length of time available for viewing and the inherent attraction by man to areas where land and water meet

- possible decline in tourism revenues associated with unfulfilled visitor expectations

HERITAGE RESOURCES - 1 (3)

Title: Avoid known archeological and historic sites

Value of Resource:

. these resources provide opportunities for gaining insights into our common heritage

. identified sites have regional, provincial and national significance

. sites represent elements of the cultural/historial fabric which have not been fully studied by archeologists and historians

. identification, excavation and documentation of these sites represents a level of investment by government and other agencies

. there is a limited number of sites in the area

. these sites are afforded some measure of legal protection to ensure the integrity of the site

. the nature and form of the physical setting of these sites represents an integral part of the site character

Potential Change:

. construction activities associated with the facilities may result in disruption or destruction of site

. construction and use of access roads may lead to disruption or destruction of site and provide uncontrolled access to site

. presence of transmission facilities may alter the character of the landscape adjacent to these sites to the extent that the essence of the site in relation to its surroundings is altered

Possible Mitigation Measures:

. minimize disturbance to site through consultation with government and other agencies

. limit access to ROW by minimizing number of access roads constructed and number of roads maintained after construction

. minimize visual impacts of facilities through protective screenings, selective cutting, structure placement and alignment of new access roads

Net Impact:

- disturbance or loss of site due to presence of transmission facilities
- loss of, and interference in research and field work opportunities and imposition on interpretive programmes at site
- loss or disturbance of site from uncontrolled access

HERITAGE RESOURCE - 2 (10)

Title: Avoid areas with high archeological potential and historic trails

Value of Resource:

- these areas may provide future opportunities for investigation and delineation of our cultural heritage
- these areas have not been fully evaluated, but, based upon current understanding, may be expected to yield additional information to the cultural record
- Ministry of Citizenship and Culture has legal power to order suspension of activities in the event of site occurrence
- archeological investigation of ROW alignment is necessary to fulfill terms of the Environmental Assessment Act
- these high potential areas are usually, but not always, associated with lakes, rivers and wetlands

Potential Change:

- construction activities may inadvertently result in disruption or destruction of sites
- ROW and access road alignment may allow uncontrolled access to high potential areas thereby facilitating disturbance and loss of sites
- presence of facilities and access roads will have direct visual impact on discovered sites and known trails by detracting from the character of the site

Possible Mitigation Measures:

- retain professional archeologist to undertake surveys prior to commencement of construction activities
- consult with government and other agencies before and during construction to minimize possible impacts
- reduce level of construction activity and equipment requirements as much as possible in areas of high archeological potential
- control access to ROW by limiting number of access roads constructed and limiting number of access roads maintained after construction

Net Impact:

- possible loss or disturbance of resources due to accidental encounter with unknown archeological site
- provision of uncontrolled access may lead to disruption or destruction of sites or trails
- new sites may be encountered and artifacts retrieved as a result of field activities
- interruption of work schedule may result in the event of a site discovery

HERITAGE RESOURCES - 3 (15)

Title: Avoid unique geological areas

Value of Resource:

- these sites and assemblages have unique characteristics rendering them locally and provincially significant
- these sites provide interpretive opportunities for gaining insight into the landscape formation processes
- these sites are deemed worthy of protection by the Ministry of Natural Resources

Potential Changes:

- possible loss or disruption of site due to construction activities
- presence of ROW may have visual impacts to and from sites which would reduce or impair scenic attributes of site
- construction and maintenance of access roads may disturb or destroy site

Possible Mitigation Measures:

- minimize disturbance to site through consultation with Ministry of Natural Resources and other agencies
- minimize visual impairment through selective cutting and screening along ROW
- minimize landscape contrasts due to the presence of the ROW through maintenance of compatible vegetative cover
- minimize impacts of access road construction by minimizing number of access roads and limiting number of roads maintained after construction

Net Impact:

- possible disruption or loss of site due to transmission facility construction and operation
- possible loss of interpretive potential of these sites due to the ROW
- visual impacts to and from these sites due to presence of transmission facilities

MINERAL RESOURCES - 1 (11)

Title: Avoid (a) active and dormant mine operations, mine waste areas and areas of proposed developments, and (b) active and dormant MTC, MNR and municipal sand and gravel pit operations including MNR aggregate reserves

Value of Resource:

(Mining)

- mining industry is vital to the local, provincial and national economies
- mining facilities represent high capital investment and high risk potential in the extraction of a non-renewable resource
- economic conditions and technological improvements may lead to reactiviation of dormant mine sites, expansion of existing mines or reworking of waste material
- areas of mine waste disposal may prove unsuitable for transmission facilities from geotechnical and/or a non-compatible use criteria

(Sand and Gravel)

- these areas represent sites of active operations, or those areas held in reserve to meet perceived requirements in the near future
- these operations represent considerable capital investment in terms of equipment
- due to economics of the aggregate industry, these sites are generally located at the optimal location and re-location due to impingement of the site may result in economic disadvantages
- these operations contribute to the local economy in terms of salaries, taxes, royalties, supplies, etc.

Potential Change:

(Mining)

- construction activities and the presence of structures, guys and conductors may alter nature of surface operations
- presence of structures, guys and conductors may alter the availability of and accessibility to deposits

. possible removal of mine-related structure due to land use restrictions imposed by construction, operation and maintenance of transmission facilities

. presence of structures, guys and conductors may influence location and site layout of proposed mining developments

(Sand and Gravel)

. transmission facilities may alter or limit the availability of, or accessibility to deposits

. transmission facilities may interfere with safe and efficient operation of equipment, e.g., crusher plant and loading conveyors requiring modifications to plant layout, schedule of operations, etc.

. transmission facilities construction activities may interfere with normal pit operations

Possible Mitigation Measures:

(Mining)

. minimize interference with existing and proposed surface operations; e.g., through consulation with affected property owners, special construction techniques, etc.

. minimize portion of existing and proposed mining sites obstructed by transmission facilities, e.g., by increasing span distance, adjustments to corridor alignment, etc.

(Sand and Gravel)

. minimize portion of deposit obstructed by transmission facilities and access roads by consulting with government agencies and pit operators, crossing deposit at right angles at narrowest point, limiting number of structures, etc.

. minimize interference with equipment operations by, e.g., maximizing height of conductor over deposit

. minimize interference with normal pit operations through consultation with pit operators and scheduling of facilities construction

Net Impact:

(Mining)

- possible interference with open pits, surface equipment and facilities, existing electrical system and the use of powder magazines
- possible restrictions to further developments and expansions of existing mining operations
- possible limitations to new developments due to presence of transmission facilities
- limitation to future site rehabilitation after resource depletion
- possible economic losses related to all of the above

(Sand and Gravel)

- loss of aggregate at structure bases
- possible limitations on future expanson of pit operations
- limitations on movement and use of equipment due to transmission facilities
- possible requirement for re-scheduling of pit operations and redesign of plant layout
- loss of revenue associated with the above

MINERAL RESOURCES - 2 (22)

Title: Avoid areas designated as possessing a high mineral potential

Value of Resource:

- areas so designated offer greatest potential for mineral occurrence based upon geologic setting and mining history
- high mineral potential areas have been designated by MNR as being critical to the achievement of the mineral management policy and non-compatible land use activities will be discouraged

Potential Change:

- transmission facilities could alter the accessibility to, exploration of and availability of mineral deposits

Possible Mitigation Measures:

- minimize portions of high potential deposits obstructed by the ROW through consultation with local geologists, crossing deposits at right angles and at narrowest point (where applicable), minimizing number of structures, etc.
- inform local Mining Recorder of proposed route location

Net Impact:

- loss of potential mineral deposits due to presence of transmission facilities
- possible restrictions on exploration, drilling, movement and use of equipment due to presence of tranmission facilities
- loss of revenue associated with the above

MINERAL RESOURCES - 3, 4 (24, 25)

Title: Avoid areas designated as critical (3) and significant (4) for aggregate extraction

Value of Resource:

. extraction industry is a contributor to the local economy

. aggregates are a required raw material for a number of uses such as road construction, the building industry and the mining industry

. aggregates represent a non-renewable resource usually associated with glacial deposits which also offer potential for other uses; e.g., timber production, recreation, etc.

. aggregate resource areas also act as sources of groundwater and form part of major aquifer systems required for residential, industrial and commercial uses as well as forming an integral part of the regional hydrological cycle

. some of these areas are currently being utilized for aggregate purposes as well as other land use activities; e.g., Kettle Lakes Provincial park, agriculture, etc.

. the Ministry of Natural Resources Regional SLUP and District Background Information documents have given designations to aggregate deposits in the study area based upon quality, quantity and accessibility

. according to the Regional SLUP, non-compatible uses will not be permitted on Crown Land prior to extraction of critical deposits; non-compatible uses will be discouraged on private land or significant deposits prior to extraction

Potential Change:

. transmission facilities will alter the accessibility to, and the availability of the deposits

. transmission facilities will require alteration of extraction techniques, equipment requirements and schedule of operations

. presence of tranmission facilities and activities associated with their construction may have impacts on groundwater resources contained within the aggregate deposit

Possible Mitigation Measures:

. minimize imposition on critical and significant deposits through consultation with government and industry

. minimize portions of critical and significant deposits obstructed by ROW and access roads by several methods; e.g., crossing deposit at narrowest width at right angles, limiting the number of towers within deposit, minimizing number of access roads and abandoning those not required for maintenance

Net Impact:

. loss of potential aggregates near towers and under access roads

. possible limitations on future extraction by presence of towers and conductors

. loss of revenues associated with the above

. possible impacts upon groundwater recharge areas associated with aggregate deposits

APPENDIX B

PUBLIC INVOLVEMENT

B1 Citizens Committee Members, "Supply to Kirkland Lake Study, 1981"

B2 List of Public Contacts

B3 Media Coverage

B4 Provincial Government Ministry Contacts and EA Reviewers

B1 Citizens Committee Members
(Supply to Kirkland Lake Study, 1981)

Timmins/Matheson Citizens Committee

Mr. Ronald Peterson	City of Timmins Planning Director
Mr. Dennis Welin	City of Timmins, Alderman (Vice-Chairman - Planning Committee)
Mr. Robert Barber	Township of Black River - Matheson
Mr. Ben Legouffe (replaced Mr. Jim Mills)	Ministry of Natural Resources - Timmins District Planner
Mr. Aurele Gervais	Ministry of Industry and Trade (Timmins)
Mr. J. Douglas Yeo	Timmins Resident - Timmins Chamber of Commerce
Mr. Lloyd Netherton	Kidd Creek Mines (retired)
Mr. Lorne Fleece	Ontario Northland, Cochrane
Mr. Leslie Humphries	Matheson resident
Mr. William Russell	Timmins Fur Council
Mr. Kees Pols	Mattagami Region Conservation Authority
Mr. Victor Gibbons	Northern Ontario Farmers Association
Mr. Raymand Eddy	Timmins resident
Mr. Elmer Cook	Matheson farmer
Mr. Kenneth Doherty	Timmins Museum/Porcupine Camp Historical Soc.
Mr. Edmund Palubiskie	Porcupine Rod and Gun Club
Mr. Paul Sabourin	Ministry of Agriculture and Food (Matheson)
Mr. A. Wesley	Ministry of Citizenship and Culture (Timmins) Native Community Br.
Mr. Murray Deadman	Sheraton Local Roads Board
Mr. Douglas Rogerson	Northern Ontario Tourist Outfitters (North Bay)

Kirkland Lake Citizens Committee

Mr. William Taylor	Town of Kirkland Lake, Councillor
Mr. Frank Scally	Town of Kirkland Lake, Chief Building Official
Ms. Eleanor Moro	Ministry of Natural Resources (Kirkland Lake), District Planner
Mr. Karl Redden	Timiskaming Municipal Association, Mayor of Englehart
Mr. Ian MacPheson	Kenogami, Recreational Trails
Mr. Robert Allen	Kirkland Lake, Game and Fish Protective Association
Mr. Reg Brand	Ontario Federation of Anglers and Hunters
Mrs. Carolyn O'Neil	Kirkland Lake Architectural Conservation Advisory Committee
Mr. Gerald Killoran	Kirkland Lake resident
Mr. Bernard LaRose	Kirkland Lake resident

Iroquois Falls Area Members

Dr. H.O. Kreiner	Ice Chest Lake Cottage Owner's Association
Mr. Bruce Cameron	Big Nellie Lake
Mr. Dave McQueen	Economic Development Committee (Town of Iroquois Falls)
Mr. George Hannah	Councillor, Town of Iroquois Falls
Mr. Joffre Tessier	Jack Pine Snowmobile Club

B2 List of Public Contacts

B2.1 MPs, MPPs

Mr. Aurele Gervais, MP - Timmins-Chapleau
Mr. John A. MacDougall, MP - Timiskaming
Mr. Keith Penner, MP - Cochrane-Superior
Hon. Rene Fontaine, MPP - Cochrane-North
Mr. David Ramsey, MPP - Timiskaming
Mr. Alan Pope, MPP - Cochrane-South

Local Elected and Appointed Officials

Mayor L. Cutten and Council, Town of Iroquois Falls

Mayor V.M. Power and Council, City of Timmins

Dr. R. Killingheck, Reeve, Corporation of the Township of Black-River-Matheson

Mr. E.R. White, Chairman, Mattagami Region Conservation Authority

B2.2 Other Publics

Ontario Federation of Agriculture
Matheson Agricultural Society
Porcupine District Agricultural Society
Ontario Federation of Anglers and Hunters
Black-River-Matheson Museum
Nighthawk Retreat Trailer Camp

B3 Media Coverage

As part of the communications program for the study, news releases and advertisements were issued regularly to the local media.

Newspapers	Radio and Television Stations
. Timmins Daily Press	CKGB - AM Radio - Timmins
. The Enterprise - Iroquois Falls	CFCL TV - Timmins

B4 Provincial Ministry Contacts and EA Reviewers

Ms. S. Singh, Agriculture and Food
Ms. S. Robinson, Agriculture and Food
Mr. G. Lethbridge, Community and Social Services
Mr. J. Rabeau, Community & Social Services
Mr. R. Bowes, Citizenship and Culture
Mr. M. Fram, Citizenship and Culture
Mr. J. Lang, Energy
Ms. E. Kliwer, Environment
Ms. I. Wygodny, Environment
Mr. J. Tamm, Government Services
Mr. K. Croswell, Industry and Trade
Ms. D. Dubbin, Labour
Mr. R. Kennedy, Municipal Affairs and Housing
Mr. L. Douglas, Natural Resources
Mr. R.A. Riley, Natural Resources
Mr. J.F. Gosnell, Natural Resources
Mr. J.E. Hamilton, Natural Resources
Mr. A.F. Papineau, Natural Resources
Mr. G. Holman, Tourism and Recreation
Mr. J. Foster, Transportation and Communications
Ms. C. Lonero, Treasury and Economics
Mr. J. Polika, Attorney General
Supt. J. Houston, Solicitor General
Mr. D.S. Mann, Northern Development and Mines

Chiefs of Ontario

Environment Canada, Environmental Protection Service

Mr. D.J. Patterson, Dept. of Indian and Northern Affairs
Ms. J. Clapp, Office of Native Affairs Policy
Mr. J. Hutton, Monteith Correctional Centre

ME
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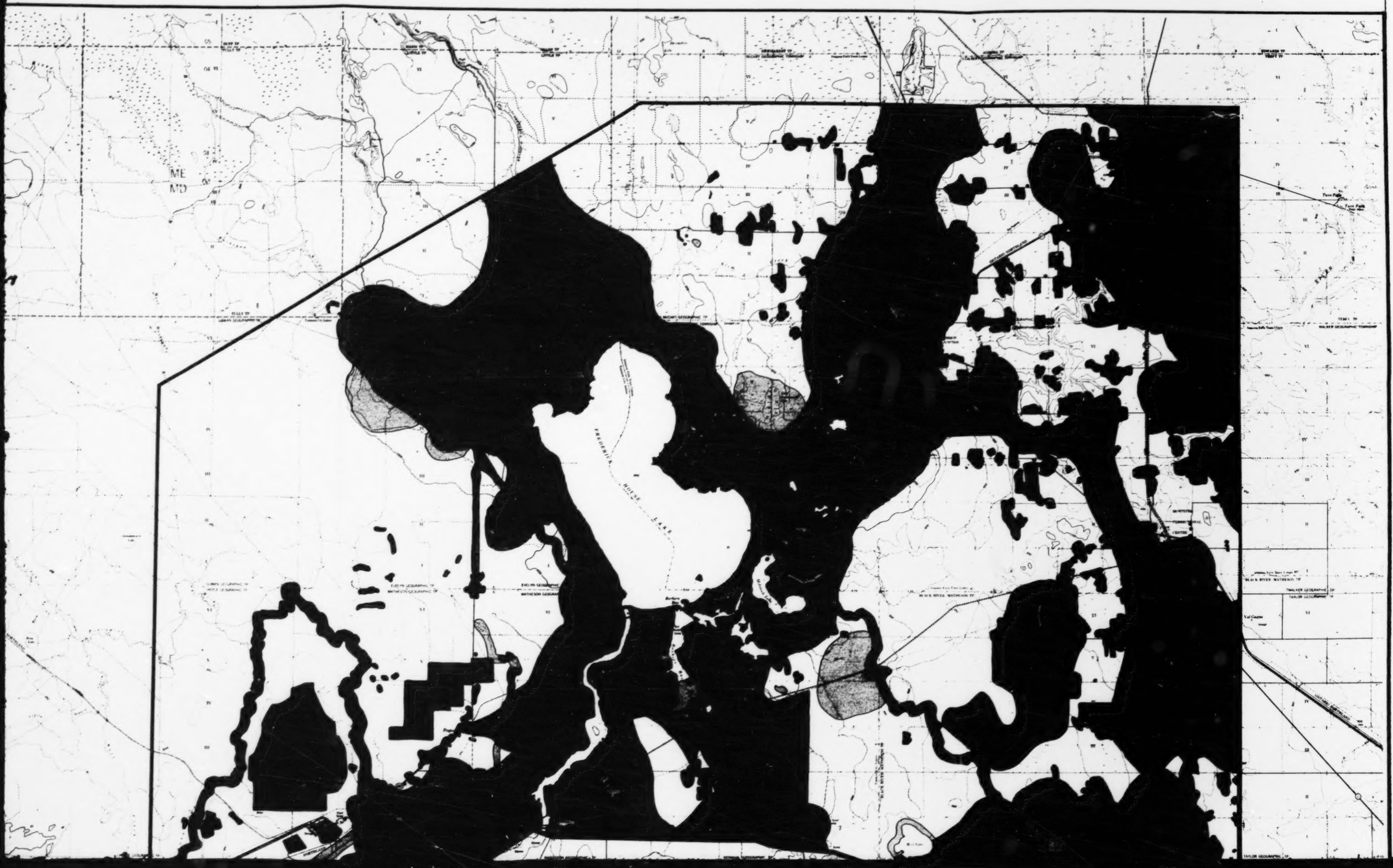

Legend

- Study Area Boundary
- 500 kV Line
- 230 kV Line
- 115 kV Line

Constraint Levels*

- Level 1
- Level 2
- Level 3
- Level 4

* Refer to Table 9.1 for a list of the land use and environmental resources (i.e. data types) contained within each level of constraint

1 0 1 2 3

TIMMINS

South Porcupine

NORTHEAST BAY

Night Hawk Lake

NIGHT HAWK LAKE

Figure 9.1
Land Use and Environmental Constraint Map

Ontario Hyd
Design and Developme
Division – Transmissi

Supply to Abitibi-Price (Iroquois Falls)

Drawn by DW	Graphics Production Supervisor DSH
Date Nov 1985	Co-ordinating Planner
Work Order 830 03720 60	
Drawing No. RS 263-LUEP-MAP-0004	Rev.

MAPS NOT

FILMED

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